

S002002-002003	2
S002004-002006	4
S002007	7
S002008-002074	8
S002075--002076	75
S002077	77
S002078	78
S002079	79
S002080	80
S002081	81
S002082	82
S002083	83
S002084-002085	84
S002086-002089	86
S002090	90
S002091-002092	91
S002093-002102	93
S002103-002159	103
S002160-002161	160
S002162-002163	162
S002164-002165	164
S002166-002167	166
S002168-002169	168
S002170-002177	170
S002178-002226	178



UNITED STATES GOVERNMENT
NATIONAL LABOR RELATIONS BOARD
OFFICE OF THE GENERAL COUNSEL
Washington, D.C. 20570

June 29, 2001

Re: American Institute of Physics
Case No. 5-CA-29366

Kirsten Lea Doolittle, Esq.
Dickstein, Shapiro Morin & Oghinsky, LLP
2101 L Street, N.W.
Washington, D.C. 20036-1526

Dear Ms. Doolittle:

Your appeal from the Regional Director's refusal to issue complaint has been carefully considered.

The appeal is denied. The evidence adduced during the Regional Office investigation established a *prima facie* case that Charging Party Jeff Schmidt was discharged for engaging in protected concerted activities. Thus, the evidence indicated that Jeff Schmidt engaged in extensive protected activity for over a decade, that the Employer had knowledge that Schmidt was engaged in such activity, and that the Employer bore animus towards Schmidt for engaging in such activity. However, it was further concluded that the evidence is also sufficient to establish that the Employer met its *Wright Line* [*Wright Line*, 251 NLRB 1083 (1980)] burden of establishing that it would have discharged Mr. Schmidt for his conduct relating to his book publishing in any event notwithstanding his role in protected concerted activities. The evidence in this regard indicates that Mr. Schmidt had a non-work related book published which contained an introduction with the following words: "This book is stolen. Written in part on stolen time, that is. I felt I had no choice but to do it that way...." The Employer asserts that when it learned of this statement it immediately discharged Mr. Schmidt for failing to spend his work time on company business.

While the appeal asserts that it is common industry practice for employees such as Mr. Schmidt to engage in writing activity during work hours for publishers other than their own employer, it was concluded that it is the practices of this particular Employer and not the publishing industry as a whole that is relevant to this matter on appeal. In this regard, the evidence submitted in support of the appeal concerning the Employer's alleged tolerance of other employees doing writing work for other publishers on company time was deemed distinguishable from the facts of the case on appeal. Thus, the articles in question were written some years ago and are not reasonably contemporaneous with Mr. Schmidt's discharge. Moreover, such articles, unlike Mr. Schmidt's book, appear to have some relationship to the field of physics.

The appeal further asserts that Mr. Schmidt did not actually "steal" company time, but merely engaged in literary hyperbole in his book introduction. However, given the nature of the work involved in this matter, it was concluded that the Employer has some justification for taking Mr. Schmidt at his word rather than treating this as a mere literary device to catch the interest of a reader. Moreover, and most significantly, even if Mr. Schmidt did not actually work on his book project on company time, by asserting that he did, he served to undercut Employer efforts at enhancing employee productivity.

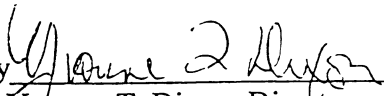
Thus, in view of all the above, it was concluded that the Employer met its burden under *Wright Line* of establishing that Mr. Schmidt would have been discharged for the above conduct even absent his participation in protected concerted activity.

While Employer threats of discipline and other retaliatory conduct in order to discourage employees from discussing working conditions with each other and informing the Employer of their collective concerns is conduct violative of the National Labor Relations Act, in view of all the circumstances of this matter, it was concluded that issuance of complaint regarding this particular allegation would not effectuate the purposes and policies of the Act.

Accordingly, further proceedings herein were unwarranted.

Sincerely,

Arthur F. Rosenfeld
General Counsel

By 
Yvonne T. Dixon, Director
Office of Appeals

cc: Director, Region 5
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Marc H. Brodsky, American Institute of Physics, 1 Physics Ellipse, College Park, MD
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Mr. Jeffrey Schmidt, 3003 Van Ness St., N.W., Apt. W406, Washington, DC 20008

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August 7, 2001

Arthur F. Rosenfeld
General Counsel
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1099 14th Street, NW
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Re: American Institute of Physics, Case No. 5-CA-29366

Dear Mr. Rosenfeld:

We write to ask you to reconsider the Office of Appeals decision, dated June 29, 2001, refusing to issue a complaint in the above-referenced matter. Although we recognize that reconsideration is unusual, we think it appropriate here for two reasons. First, this case presents the type of circumstance where the protections of the Act are most needed. Mr. Schmidt is an employee who banded together with his fellow employees to present their grievances to management. The June 29, 2001 response concludes that management's response violated the Act.¹ Mr. Schmidt is not supported by a large labor organization; his only recourse is the Board. Therefore, if the Board does not protect his rights, legal violations will go unremedied.

Second, we respectfully suggest that the conclusion, that Mr. Schmidt's discharge did not violate the Act, rests on three fundamental errors. Two principal findings of the Office of Appeals are not supported by the facts. In addition, the American Institute of Physics's ("Institute") newly stated reason for Mr. Schmidt's discharge presents a completely different story from the Institute's initial rationale and one to which Mr. Schmidt should be given an opportunity to respond.

The dismissal letter begins from the premise that Mr. Schmidt established a "*prima facie* case that [he] was discharged for engaging in protected concerted activities." Nonetheless, it concludes that the employer "met its *Wright Line* burden of establishing that it would have discharged Mr. Schmidt for his conduct relating to his book publishing in any event notwithstanding his role in protected concerted activities." In support of this finding, Ms. Dixon explains that "the evidence presented in support of . . . the [Institute's] alleged tolerance of other employees doing writing work for other publishers on company

¹ Specifically, the Office of Appeals acknowledged that "the evidence indicated that Jeff Schmidt engaged in extensive protected activity for over a decade, that the [Institute] had knowledge that Schmidt was engaged in such activity, and that the [Institute] bore animus towards Schmidt for engaging in such activity." The Office of Appeals also recognized that the Institute had made "threats of discipline and other retaliatory conduct in order to discourage employees from discussing working conditions with each other and informing the [Institute] of their collective concerns. . . ."

time was deemed distinguishable from the facts of the case on appeal." Id. [emphasis added].

The "distinguishing" facts listed were: (1) the articles written by employees who were not fired were written some years ago and are not "reasonably contemporaneous with Mr. Schmidt's discharge"; and (2) those articles, "unlike Mr. Schmidt's book, appear to have some relationship to the field of physics."

The first distinction would support a *Wright Line* defense only if the Institute's policy of allowing its employees to pursue freelance projects on their free time had changed since the time in which Mr. Schmidt's coworkers openly pursued freelance work without repercussion. In fact, there was no such change in the Institute's policy; it never advised Mr. Schmidt or others that the academic workplace culture had changed and that outside writing on Institute time was now prohibited. Thus, this first distinction is a hollow one. The simple fact is that Mr. Schmidt was treated differently than others who wrote freelance works on company time, and the only credible reason for that differential treatment was his protected activity and management's hostility toward it.

The second distinction is simply wrong as a matter of fact. Mr. Schmidt's book centers on the field of physics, and even contains physics equations. It discusses the field of physics directly, unlike the articles by Mr. Schmidt's coworkers, which do so only indirectly, if at all. The Institute knew that the book focused on physics, not only because they had the book, but also because they had read a review of Mr. Schmidt's book by Spencer Weart, a division manager at the Institute, a physicist and respected historian of science. *Physics Today* magazine, the division of the Institute in which Mr. Schmidt worked, even included the book in its New Books list, which the magazine limits to books related to physics. Thus, Mr. Schmidt's book does have a relationship to the field of physics. Since neither of the grounds for denying Mr. Schmidt's appeal are valid, the decision should be reconsidered and Mr. Schmidt's appeal should be granted.

Finally, the Office of Appeals' reliance upon the Institute's newly proposed rationale for discharging Mr. Schmidt is inappropriate because Mr. Schmidt has never been presented with such a rationale, and consequently has not had the opportunity to respond. The Institute now claims, more than six months after Mr. Schmidt's discharge, that he was discharged for undercutting the Institute's "efforts at enhancing employee productivity." On the day of his discharge, however, the Institute told Mr. Schmidt that he was discharged because he had taken company time to work on a book.² The Office of Appeals' letter was the first document that Mr. Schmidt or his counsel received stating this new rationale. In these circumstances, it is clear that this rationale is an afterthought and should be viewed as pretextual.

S 002005

² The Institute gave that same explanation to Mr. Schmidt's coworkers, to the State of Maryland Department of Labor, and to the Chronicle of Higher Education.

Arthur F. Rosenfeld
August 7, 2001
Page 3

For these reasons, we respectfully request the General Counsel to reconsider Mr. Schmidt's appeal and order Region 5 to issue a complaint in the above-referenced matter.

Very truly yours,



Kirsten L. Doolittle

cc: Jeff Schmidt
3003 Van Ness St., N.W.
Washington, D.C. 20008

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S 002006



UNITED STATES GOVERNMENT
NATIONAL LABOR RELATIONS BOARD
OFFICE OF THE GENERAL COUNSEL
Washington, D.C. 20570

August 14, 2001

Re: American Institute of Physics
Case No. 5-CA-29366

Kirsten Lea Doolittle, Esq.
Dickstein, Shapiro Morin & Oghinsky, LLP
2101 L Street, N.W.
Washington, D.C. 20036-1526

Dear Ms. Doolittle:

This is in response to your request for reconsideration postmarked August 7, 2001, of our June 29, 2001 decision sustaining the Regional Director's refusal to issue complaint in the above-captioned matter.

Your request must be rejected as untimely filed under Section 102.19(c) of the Board's Rules & Regulations which, in pertinent part, provides:

A motion for reconsideration of the decision must be filed within 14 days of service of the decision, except as hereinafter provided, and shall state with particularity the error requiring reconsideration. A motion for reconsideration based upon newly discovered evidence which has become available only since the decision on appeal shall be filed promptly on discovery of such evidence.

Inasmuch as your request for reconsideration did not meet the timeliness requirements of Section 102.19(c) and since nothing contained in your request constitutes "newly discovered evidence" within the meaning of that Section, your request for reconsideration is denied and this matter is considered closed.

Sincerely,

Arthur F. Rosenfeld
General Counsel

By Yvonne T. Dixon
Yvonne T. Dixon, Director
Office of Appeals

S 002007

14 January 2002
541 signers

Marc H. Brodsky
Executive Director and CEO
American Institute of Physics
One Physics Ellipse
College Park, Maryland 20740

Dear Dr. Brodsky:

As physicists and other scientists concerned about freedom of expression in the science community, we were troubled to learn of your dismissal of Jeff Schmidt, who had been an articles editor at *Physics Today* magazine for over 19 years.

As we understand it, you fired Jeff after you saw his book, *Disciplined Minds*, and in particular after you learned that Jeff had used some of his spare time at the office for critical writing about education and employment in physics and other fields.

While we do not necessarily agree with Jeff's views about the situation of physicists and other salaried professionals, and do not expect you to, we believe that free debate within the physics community is healthy. We expect you to encourage it, not stifle it, especially because physicists are known for speaking out when physicists internationally are punished for expressing their views. Your actions as head of the American Institute of Physics help to shape society's view of the physics community. We urge you to reconsider your decision, and offer to reinstate Jeff as an editor at *Physics Today*.

We ask that you publish this letter in *Physics Today*, to bring our concerns to the attention of the wider physics community.

Sincerely,

(This letter expresses the views of the undersigned;
affiliations are listed for identification only.)

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S 002059

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S 002068

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S 002073

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S 002074

21 June 2000

Marc Brodsky, Executive Director
American Institute of Physics
One Physics Ellipse
College Park, Maryland 20740

Dear Dr. Brodsky:

We were dismayed to learn of the recent dismissal of Jeff Schmidt, who had been an articles editor at *Physics Today* magazine for over 19 years. As former employees of the magazine, we urge you to reconsider your decision.

As we understand it, Jeff was fired after the publication of his book, *Disciplined Minds*, and in particular after AIP managers heard about the book's opening lines: "This book is stolen. Written in part on stolen time, that is." According to Jeff's supervisor, Stephen Benka, this intentionally provocative statement proved that Jeff was not "fully engaged" at the magazine.

Under different circumstances, we might find some humor in the fact that Jeff's declaration, obviously made for dramatic effect, would create such a stir. But there's much more at stake here: you have chosen to deprive Jeff of his livelihood. We take deep exception to that.

Whether Jeff — or, for that matter, anybody else at *Physics Today* — was "fully engaged" is really immaterial. What counts, or what should count, is that Jeff did his work for the magazine, and AIP invariably gave him above-average or satisfactory ratings in his performance reviews. Your recent discovery that Jeff used his spare time for critical writing, rather than surfing the Net, exchanging personal e-mail, or other common diversions, shouldn't be cause for punitive action. It's also worth noting that the use of one's spare time at the office to work on a book is a time-honored tradition among journalists. Indeed, many employers encourage it, recognizing that it boosts the professional standing of their employees and enhances the reputation of the organization.

We have all worked with Jeff, and we know him to be a talented and conscientious editor. While at *Physics Today*, we benefited from his camaraderie, support, and good ideas. Authors who worked with Jeff, as well as *PT* staff members themselves, will tell you that Jeff performed his duties with admirable skill and efficiency. He is a clear, careful journalist, and he has a deep interest in physics and in the social issues surrounding it. What is more, he worked hard to improve the work environment at the magazine. *Physics Today* has been a better place for his presence.

It is our strong belief that you erred in firing Jeff. We therefore urge you to give him his job back.

Respectfully,

S 002075

Paul Elliott (Alexandria, Virginia)
Daniel Gladstone (Southold, New York)
Alexander Hellemans (Naples, Italy)
Jesse Hochstadt (Providence, Rhode Island)
Marlowe Hood (Paris, France)
Jay Iorio (Bedminster, New Jersey)
Pat Janowski (Portland, Oregon)
Jean Kumagai (Brooklyn, New York)
Margaret Marynowski (Brookline, Massachusetts)
Chris Mohr (San Francisco, California)
Madhusree Mukerjee (Queens, New York)
Corey Powell (Brooklyn, New York)
Matthew Siegel (Brooklyn, New York)
Sharon Singletary-Smith (Bellport, New York)
William Sweet (Brooklyn, New York)
(one name withheld by request)

NATIONAL WRITERS UNION PROTESTS FIRING OF JEFF SCHMIDT

Contact: Jonathan Tasini (212) 254-0279

New York, June 12, 2000 — The National Writers Union today protested the firing of Jeff Schmidt, a Writers Union member, from his job as a staff editor at *Physics Today* magazine, a step that was apparently taken in response to the recent publication of a controversial book that Schmidt wrote. "The firing of Schmidt is an affront to the principles of open inquiry and free speech that a magazine of science such as *Physics Today* is supposed to uphold," said Writers Union President Jonathan Tasini.

On May 31, Schmidt, a member of the Washington, D.C., local of the Writers Union, was suddenly fired after 19 years on the staff of *Physics Today*, which is published by the non-profit American Institute of Physics. The dismissal came, Schmidt says, right after his supervisors learned that he had written a book called *DISCIPLINED MINDS*, which was published last month by Rowman & Littlefield. An article about the book had appeared in the *Chronicle of Higher Education* and was making the rounds at the offices of *Physics Today*.

Schmidt admits that his book, whose subtitle is "A Critical Look at Salaried Professionals and the Soul-Battering System that Shapes their Lives," was written in a provocative tone. In fact, in the book's opening lines, he declares that the book was "written in part on stolen time," i.e., during free time at the office. Schmidt sees his dismissal from *Physics Today* "as further proof of the book's thesis: that management's paramount concern is always the political content of the work — even spare-time work."

"The content of Schmidt's book does not justify the actions of *Physics Today* management," Tasini stated. "Schmidt has a right to be provocative in his outside writing without suffering the loss of his job."

The National Writers Union, Local 1981 of the United Auto Workers, is a labor union and advocacy organization for freelance journalists, authors, technical writers, poets and other types of writers.

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Was the theory of relativity written in part on stolen time?
From *Writer's Bloc Online*, the newsletter of the Washington, D.C.,
local of the National Writers Union . . .

THE SCHMIDT FIRING: A HISTORICAL PERSPECTIVE?

By Chris Garlock, editor

For an interesting historical footnote on the question of "stealing time" from work, I recently ran across the following in Carl Sagan's *Broca's Brain*:

"At the Patent Office, Einstein 'soon learned to do his chores more efficiently and this let him snatch precious morsels of time for his own surreptitious calculations, which he guiltily hid in a drawer when footsteps approached.' Such were the circumstances attending the birth of the great Relativity Theory."

"In 1905," Sagan continues, "Einstein published four research papers, the product of his spare time at the Swiss Patent Office." The papers of course, included the famous equation, $E=mc^2$, which, among other things, says that although energy and mass can neither be created nor destroyed, one form of energy or matter can be converted into another form.

Or, to put it another way, work is work.

5 July 2000

M. V. Ramana

24 June 2000

Marc Brodsky, Executive Director
American Institute of Physics
One Physics Ellipse
College Park, Maryland 20740

Dear Dr. Brodsky:

I am writing to protest the firing of Dr. Jeff Schmidt, apparently in response to the publication of his book, *Disciplined Minds*. This action is an affront to free speech and open, critical inquiry. It is especially unfortunate that this should happen at a science magazine. Whatever I have seen of Dr. Schmidt's work has been of very high standard and I understand that he consistently received above-average or satisfactory ratings in his performance reviews. As long as employees do their jobs properly, what they do in their spare time should be of no concern to the employer.

I urge you to reconsider your decision and to reinstate Dr. Schmidt. Thank you.

Sincerely,

M. V. Ramana

Center for Energy and Environmental Studies
Princeton University

Kajoli Krishnan

26 June 2000

Marc Brodsky, Executive Director
American Institute of Physics
One Physics Ellipse
College Park, Maryland 20740

Dear Dr. Brodsky:

Science would not have flourished and evolved beyond Ptolemy if the free spirit of inquiry had been curbed. It is a pity that an institution that supports and thrives on scientific research and progress should act in a manner so regressive as to fire an employee for his intellectual honesty and expression. This act reeks of the insecurity that can possess only the intolerant and the orthodox. One cannot expect it from the American Institute of Physics. I do hope that AIP will change her mind and take Jeff Schmidt back.

Kajoli Krishnan

Physicist
Bangalore, India

Vikram Vyas

28 June 2000

Marc Brodsky, Executive Director
American Institute of Physics
One Physics Ellipse
College Park, Maryland 20740

Daniel Kleppner, Chair,
Physics Today Advisory Committee
Department of Physics
Massachusetts Institute of Technology
Cambridge, MA 02139

Dear Dr. Marc Brodsky and Prof. Daniel Kleppner,

Recently a friend informed me of the firing of Jeff Schmidt. After reading the relevant material available to me I strongly feel that this act goes against everything that we as physicists stand for.

It reminded me of physicist Richard Feynman's Caltech commencement address of 1974:

"So I have just one wish for you — the good luck to be somewhere where you are free to maintain the kind of integrity I have described, and where you do not feel forced by a need to maintain your position in the organization, or financial support, or so on, to lose your integrity. May you have that freedom."

I do appeal to you that Jeff, too, may have the freedom that Feynman wished for all of us.

Yours sincerely,

Dr. Vikram Vyas

International Centre for Theoretical Physics
Trieste, Italy
and

The Ajit Foundation
396 Vasundhara Colony
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India
<http://indev.nic.in/ajit/>

S 002081

Thomas Nagy

26 June 2000

Marc Brodsky, Executive Director
American Institute of Physics
One Physics Ellipse
College Park, Maryland 20740

Dear Dr. Brodsky:

I strongly endorse the position of my colleague, Dr. Cioffi, that Dr. Schmidt's job should be returned to him.

With the resurrection of Star(t) Wars, American science's own Lysenko affair, it becomes imperative that principled dissent to official folly be cherished rather than liquidated.

Sincerely,

Thomas J. Nagy, Ph.D.

Associate Professor of Expert Systems
George Washington University

S 002082

Surendra Gadekar

30 June 2000

Marc Brodsky, Executive Director
American Institute of Physics
One Physics Ellipse
College Park, Maryland 20740

Dear Mr. Brodsky,

Physics Today has been for many people like me a source of good reading. Many are the pleasant hours that I spent in the library at the Indian Institute of Technology, Kanpur, and at the library at Iowa State University (where I did my postdoc) reading the journal. But a journal can maintain high journalistic standards if and only if the people working on it are joyful and not afraid of adverse consequences in case their free-time activity displeases their bosses.

Your action terminating the services of Jeff Schmidt for "not being fully engaged" with the journal smacks of vindictiveness. If Mr. Schmidt had been incompetent or not giving his best to the journal, surely you could have found that out sometime sooner than after 19 years. To a disengaged observer like me it seems that you have not been fully engaged in the journal or else it would not have taken you so long.

The very fact that you found Mr. Schmidt's performance perfectly satisfactory for so many years shows that your action is prompted more to set an example to others in the organization. It is an action that is bound to result in the deterioration of the quality of writing at *Physics Today*.

This letter is an appeal to you to reconsider your hasty step and restore Mr. Jeff Schmidt to his job. That action would not undo all the damage caused, but at least it would be a step in the right direction.

Sincerely,

Dr. Surendra Gadekar

Sampoorna Kranti Vidyalaya
Vedchhi 394641 India
Publisher of *Anumukti*,
South Asia's only anti-nuclear magazine

Marlowe Hood

June 15, 2000

Randolph A. Nanna
Publisher
Physics Today
One Physics Ellipse
College Park, Maryland 20740

Dear Mr. Nanna:

What did you gain by firing Jeff Schmidt? I am flummoxed by this question as I consider all the things you damaged or lost: *Physics Today*'s most competent articles editor; the magazine's perennially fragile collective morale; and, most flagrantly, AIP's public image and credibility. Let's take these one by one.

Unless another blue-pencil virtuoso of even greater talent has joined the staff since my year-long stint with the magazine in the early 1990s, Jeff was the best articles editor you ever had or are likely to have. (I've spent more hours than I care to count doing the same thing, so I know whereof I speak.) Not only does he edit with an all-too-rare technical precision, he has an uncanny ability to coax even the most prickly of authors toward clarity and coherence. Titles and hubris do not cow him, and he is doggedly but politely persistent. Ask any of the hundreds of authors who have benefited from his patient — dare I use the word — professionalism. Jeff would no doubt bristle at such a compliment, but what else does one call the ability to perform consistently at such high levels even if one is, assuming for a moment that your inference from his book is correct, less than "fully engaged" in one's work? Indeed, what more can you ask of an articles editor — even one with a PhD — except that he do his job well? Is it reasonable to also demand devotion? Do you even have the right to?

If misuse of company time is the principal crime for which Jeff has been tried and convicted, then I can assure you that — during the time I worked in the same office — he was far from the most egregious offender. Others must come forward on their own, but I certainly can speak for myself: not only did I spend time researching and writing a weekly column for a major daily newspaper while sitting at my desk, the staff spent a fair amount of time discussing the topics I chose. It was no secret. I did every scrap of work that was given to me as soon as it was given to me. But I reclaimed the time left over as my own.

As for the morale of the magazine's staff, what did you anticipate the impact of dismissing Jeff would be? Is this intended as a lesson to his erstwhile colleagues? If so, the lesson will probably have backfired. Do you expect that things will run more smoothly now that you are rid of this alleged rabble rouser? Jeff was open and above-board in his efforts to improve, as he saw it, the work environment at *Physics Today*. One could disagree with his ideas, as I sometimes did, but still respect the integrity and aim of his efforts. The fact that neither these activities nor the writing of his book interfered with his contractual duties is evident from his long-term tenure at the magazine.

Finally, it is AIP's credibility that will suffer most. How can an organization purporting to represent the highest form of science summarily dismiss a proven employee of long standing without an inquiry or even offering him the chance to defend or explain himself? Where is the scientific method in that? Did it ever occur to you to ask *how much* time Jeff actually "stole" or whether the opening line to his book was simply an attention-grabbing, rhetorical flourish? I'm sorry to put it so bluntly, but the whole sorry affair makes you look just plain bad, and it will not pass unnoticed. The article in the *Chronicle of Higher Education* is only a foretaste of the interest this episode is likely to generate.

In the end, you will, I am convinced, regret firing Jeff Schmidt and frog-marching him out the door. Alas, it will probably be for the wrong reasons.

Sincerely,

Marlowe Hood

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Maître de Conférence, French Press Institute (Sorbonne)
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cc: Marc H. Brodsky, James H. Stith

A Current Example of Irresponsible, Unaccountable Management

Denis F. Cioffi
Draft 1.27, 26 June 2000
Comments & links welcome.

*Why do managers get paid more than workers
when they don't know how to manage?*

I teach project management at the graduate level at George Washington University, but a few years ago I worked at *Physics Today* magazine. Until recently that experience had given me few management stories for the classroom. (The one minor exception is when the editor-in-chief told me that seven of my eight possible stories for the next month were a priority.) Now, though, the American Institute of Physics, the organization that publishes PT, has provided a stellar example for my colleagues and students.

Jeff Schmidt, an articles editor at the magazine, was fired on 31 May 2000 after his managers learned that he had written a book, Disciplined Minds: A Critical Look at Salaried Professionals and the Soul-Battering System That Shapes Their Lives. For 19 years at PT, Schmidt received satisfactory or above-average performance ratings. I wanted to post this article before reading his book because the content of the book is irrelevant to my arguments. However, the book must be worthwhile, or why would AIP have given it such good publicity?

But AIP claims the book's contents are irrelevant to its views too. A story in the *Chronicle of Higher Education* (9 June 2000) relates that AIP, speaking through its director of human resources, Ms. Theresa C. Braun, is certain that Dr. Schmidt (who has a Ph.D. in physics) was not terminated "because of the general content of the book." Oh.

As reported in the *Chronicle*, and as Dr. Schmidt confirmed to me, he was told that his creation shows he wasn't "fully engaged" at *Physics Today*. In the management books and articles I have read, I have never encountered the "fully engaged" criterion, so I am not sure what it means.

Maybe Sue Shellenbarger knows. In a recent *Wall Street Journal* article (21 June 2000), "Workplace Upheavals Seem to Be Eroding Employees' Trust," she cites a recent study of 7500 employees that found only half

trusting their senior managers. What if that fraction applies to employees of the *Journal*? I hope Ms. Shellenbarger is "fully engaged" (and not just dating?), or perhaps she will be fired soon, too.

PT and AIP management made their strange pronouncement because Dr. Schmidt begins his book with the provocative statement that it was written in part on time "stolen" from his employers -- that is, he used his spare time at the office to work on the book. The managers for whom Dr. Schmidt worked are evidently so uncertain of their own estimates of their employees' efforts that they wish to depend solely on cursory worker self-characterizations. By this management method, Dr. Schmidt's salary should have been doubled if he had instead confessed that he was so overwhelmed that he needed 75 hours to get his work done each week (the PT standard work week is 37.5 hours).

I asked PT's soon-to-be most famous ex-employee if management had tried to quantify the "stolen" time, but they had not. So let us do a calculation for them and begin by accusing Dr. Schmidt of thinking about the book at the office, even if he was not working on it directly, from the time he started at PT. Let's continue to assume that he gave PT 90 percent of his time, which is a fraction larger than management books recommend when estimating the productivity of a typical worker. At that rate, Dr. Schmidt would have spent approximately 3500 hours on the book at the office, which is probably enough time to have produced it.

With this perspective, we see clearly Dr. Schmidt's problem: he's focused. If instead he had frittered away time the way most of us do -- personal email, Web surfing, telephone calls, watercooler jokes, long lunches, workouts at the gym, theoretical physics calculations ("get that guy Einstein out of the Patent Office -- he's not fully engaged!") -- he would not have to account for it. And I used a work-time to spare-time ratio higher than studies have shown to be realistic, so perhaps we should be asking Dr. Schmidt why he has not written two books.

But what if he spent a much greater fraction of his time on the book? Suppose he did PT's work only 10 percent of the time, and he spent 90 percent of his time on the book. Dr. Schmidt has always received satisfactory or above-average performance ratings. In fact, at the time of the firing, he was two months ahead in his work, having completed his annual work quota in ten months' time -- a quota that his managers specified in writing. How efficient is this guy? They should promote him! They should have him teach everyone else in the office how to work so well! If he's only working 10 percent of the time, they could write the magazine in two or three days and take the rest of the month off. Is this discovery -- and after only 19 years -- great or what?

Responsible Management

S 002087

Peter Drucker wrote in 1973 that the ideal of the professional manager had become reality, and that the essence of the professional manager was

responsibility. Among many other concepts needed for managing projects, I teach about quality, estimating, and goals. Below I examine briefly the responsibility inherent in these three concepts in the context of The Schmidt Affair.

Quality comprises the quality of the product and the quality of management. The quality of Dr. Schmidt's editing has been judged better than satisfactory for 19 years. The hundreds of scientists whose articles he has edited and with whom he has collaborated have been pleased to work with him for 19 years. Before firing Dr. Schmidt, PT had not indicated a change in the quality of his work. Will *Physics Today* be recalling all the articles edited by Dr. Schmidt because of a just-discovered defect?

Will PT and AIP now examine the quality of their management? After their peremptory firing of Dr. Schmidt, will all the managers who have given him good reviews for 19 years be fired? Because they are managers, I suppose they should fire themselves. I do not see how they can avoid it, because surely they bear more responsibility -- one can tell by the larger size of their paychecks -- and the only logical inference from Dr. Schmidt's firing is that they have erred grievously.

Managers must estimate the time needed for project tasks. Dr. Schmidt is apparently more efficient than his managers required -- which is curious because his managers had performed the same type of work before they were promoted. Is it possible that Dr. Schmidt works better than they? Why did they not offer him a big raise when he finished 12 months' worth of work in 10 months? Why has the publication of Dr. Schmidt's book not forced them to question their own skills?

Dr. Schmidt was paid to do a job, and he did it well. Why have the managers not considered involving him more fully in the production of the magazine? It couldn't be because they would have to pay him more, could it? It couldn't be because they would have to give up some power and admit that maybe they are not as good at managing as they thought, could it?

Projects fail most frequently because of ill-defined missions. Do the managers at PT understand the goal in publishing a magazine? Is it to put out a good magazine every month, which Jeff Schmidt has helped them do for 19 years, or is it to control the spare time that we all use at the office?

The Right Course Can Still Be Chosen

I would like to remove the "Ir-" and the "Un-" from the title and praise AIP. I could do it if the AIP and PT managers would take a step back, admit they made a mistake, concede that they need someone as good as Jeff Schmidt at their magazine, and offer him his job back.

They could then proclaim their independence and security boldly, saying, "As long as you get your job done, we don't care what you do." They would have the proof of Dr. Schmidt's book on which to rest their assertion.

If they could do that, they would have creative people knocking down their doors, and the magazine might just become an exciting place to work. When I was at PT, management led me to believe that I was being considered for the position of editor-in-chief. This possibility pleased some of my colleagues, for as Dr. Schmidt put it, "you think work should be fun -- and then it's not work."

That's always been my idea of a healthy workplace, and as a management educator, I am hardly alone in this view. Shortly before his death in 1993, W. Edwards Deming, the American management icon (who, coincidentally, had a Ph.D. in mathematical physics from Yale University), reiterated his belief that much in the American system of management crushes motivation, self-esteem, and dignity. I say that if such stereotypical managers, including those of our current example, will not try to reverse their irresponsible tendencies, laugh at their follies, and correct their mistakes, they should go "fully engage" themselves.

Postscript: My Emailed note to Dr. Marc Brodsky, head of AIP

Dear Dr. Brodsky:

As a professor in the Department of Management Science at The George Washington University, I have posted a management educator's perspective of The Schmidt Affair on my website, www.toad.net/~dcioffi. Please allow me to remove the "Ir-" and "Un-" from the title by offering Dr. Jeff Schmidt his job back.

Very truly yours,

Denis F. Cioffi, Ph.D.

[HOME](#)

Copyright © 2000 by Dr. Denis F. Cioffi.
Please send intelligent comments to dcioffi@gwu.edu.

You can contact [Dr. Jeff Schmidt](#) directly or through [Disciplined Minds](#).
You can send email to [Dr. Marc Brodsky](#), Executive Director of the American Institute of Physics.

Paul Bryant

2 November 2000

Marc Brodsky, Executive Director
American Institute of Physics
One Physics Ellipse
College Park, Maryland 20740

Dear Mr. Brodsky:

As an enthusiastic reader of Jeff Schmidt's book, *Disciplined Minds*, I wish to thank you for verifying in practice the theoretical premise of that book by firing Schmidt as quickly upon its publication as you did. Despite the academy's successful manipulation of contemporary minds regarding the purpose and integrity of academia, repressive actions such as yours have historically assured that the greatest minds among us receive the legacy of praise they deserve, while those who devote their limited time on earth to hindering progressive thinking receive the scornful obscurity they have so rightfully earned. (No one remembers the names of those who sentenced Socrates to death, Galileo to excommunication or Thoreau to jail. But everyone remembers the names Socrates, Galileo and Thoreau!)

Dr. Schmidt may disagree with me (I've never communicated with the man), and I have no desire to further damage his family's livelihood as your action has, but I for one hope you do not hire him back, so that he may devote himself full-time to exposing the ridiculously tragic illusion modern academia has manufactured, to our generation's ultimate humiliation. Long after the arrogant, pretentious articles in *Physics Today* and other academic journals are reduced to museum relics of a time when The Peter Principle dominated society, *Disciplined Minds* will rank among the greatest extant sociological studies of an era in which pointless politics flourished and human purpose nearly became extinct.

Sincerely,

Paul Bryant
Sociologist
Lawrence, Kansas

Salary equity

I worked with other staff members to demand pay equity at Physics Today. On behalf of those of us who were pushing for this, I told the Physics Today advisory committee at their 4 October 1996 meeting that the large salary differentials among the staff were not only unfair, but also divisive and bad for morale and productivity. I raised the issue at various staff meetings as well. Management was not pleased by the pressure we applied, in part because it forced them to give a staff member (name withheld) a special 25% salary increase, beginning on 1 June 1997.

Affirmative action

Management's anger at me increased dramatically, and never subsided, when I worked with Jean Kumagai and other staff members (names withheld) to assert the need for equal opportunity and affirmative action in hiring at Physics Today. We raised the issue when Ray Ladbury left the magazine, creating an opening on the editorial staff. (His replacement, Charles Day, started work on 2 June 1997.) I spoke out strongly on the equal opportunity and affirmative action issue, because Jean and I and the others didn't think Physics Today or AIP management took it seriously. Our concerns were largely ignored, and so, later in the year, we decided to bring the problem to the attention of the Physics Today advisory committee at its annual meeting, held 17 October 1997. On behalf of the concerned staff members (names withheld), I brought the matter to the committee's attention.

One week later, on 24 October 1997, American Institute of Physics Executive Director/CEO Marc Brodsky called me and said that I had made "a very, very serious charge." (Detailed notes available.) He directed me to meet with him and defend my charge, and I did so on 5 November 1997. At that meeting I gave Brodsky a note summarizing the important points. Rather than repeat those points here, I am attaching a copy of the note. (See note of 5 November 1997.) That note is an important part of this appeal about my performance review, and so I ask that you read it.

At my meeting with Brodsky I also pointed out that AIP had failed to conduct the affirmative action training that it promised to conduct in its 284-page "1996 Affirmative Action Program for American Institute of Physics." (See attached excerpts.) Among the many promises that AIP makes in that 1996 document is that "During the current plan year we will be conducting training for all employees about our affirmative action program and equal employment opportunity in the workplace." I pointed out to Brodsky that AIP did not conduct the promised training. He countered by saying that he was pretty sure that he mentioned affirmative action either at the one-hour question-and-answer session that he

held on 20 June 1996 or at the Q&A meeting that he conducted for employees at AIP's facility in Woodbury, New York. (I recall no such mention at the 20 June 1996 College Park meeting.) He indicated that this mention was the promised affirmative action "training."

Brodsky said he would look into affirmative action at Physics Today and tell me what he found. After a 4.5-month investigation, he met with me on 20 March 1998 and reported that he found that Physics Today's affirmative action program was doing very well. He said he judges the program by its results. (This was mysterious, because as of 20 March 1998, the Physics Today staff in the College Park office was all white; out of a staff of 18, the magazine had only one minority employee, working from New York.) I asked again about the promised affirmative action training. This time he said he was sure that he had mentioned affirmative action at both 1996 Q&A meetings, and he again indicated that such mention was the promised affirmative action training. After extensive questioning, he said that such mention was "part of" the promised training. I asked him when the rest of the training would be done, and he promised to look into that. In the end, I told Brodsky that we still believe our concerns to be well founded and that we are disappointed with his response. Apparently in Brodsky's view, however, the upshot of what happened is that I leveled serious, totally unfounded charges at AIP, and he is not happy about that.

1997 retreat

Management's anger at me increased yet again (and has not decreased since) when I helped raise staff concerns before and during the 25 September 1997 one-day Physics Today retreat. Before that meeting, I played a leading role in producing a list of proposed agenda items that represented a few of the many staff concerns. A majority of the staff supported it, and half of the staff signed it. (See attached e-mail message of 18 September 1997.) The top item on that list was a request for greater staff participation in decision making. The days leading up to the meeting saw much debate between management and many staff members over the meeting agenda, which management was formulating. Harris became upset that the staff wasn't embracing his agenda, and he began treating me and my coworker Graham Collins as ringleaders on the staff side, apparently becoming permanently angry at us.

At the retreat itself I asked if staff members could ask questions. Harris said no. I then said that I thought that we should be allowed to ask questions. Harris angrily said "No, That's an order!" Some days after the meeting he explained that he thought my request for the right to ask questions was another attempt to promote the staff agenda. At the retreat and in subsequent weeks, a number of brave

One Physics Ellipse
College Park, MD 20740-3843

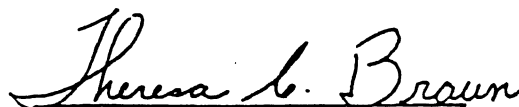
Tel. 301-209-3100
Fax 301-209-0843

1996 AFFIRMATIVE ACTION PROGRAM

FOR

AMERICAN INSTITUTE OF PHYSICS

Program completed by:



Theresa Braun
Director of Human Resources and
EEO Coordinator

Address:

One Physics Ellipse
College Park, MD 20740-3843

Program approved by:



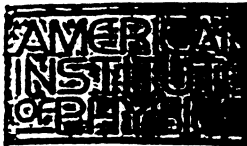
Marc H. Brodsky
Executive Director/CEO

This Affirmative Action Program is effective from January 1, 1996 to December 31, 1996.

Member Societies:

The American Physical Society
Optical Society of America
Acoustical Society of America
The Society of Rheology
American Association of
Physics Teachers
American Crystallographic
Association
American Astronomical Society
American Association of
Physicists in Medicine
American Vacuum Society
American Geophysical Union

S 002093



INTER - OFFICE MEMORANDUM

July 11, 1996

TO: Theresa C. Braun
FROM: Melinda Underwood *MU*
SUBJECT: Affirmative Action--1995

Below are the area in which AIP had underutilization in 1995:

Senior Managers	Female and Minority Underutilization
Senior Professionals	Female Underutilization
Other Professionals	Minority Underutilization

Let me know if you want to develop a narrative discussion of goals for the Affirmative Action Plan for 1996-1997.

S 002094

The American Institute of Physics--Discussion of Goals (1995)

After analyzing our Affirmative Action plan and looking at the utilization analysis, it has come to the attention of the American Institute of Physics (AIP) that underutilization of minorities and females exist in the following job group:

Senior Managers (101) Female and Minority

Sr. Professionals (201) Female

Other Professionals (202) Minority

The American Institute of Physics has been and will continue to be an equal opportunity employer. Our goals for increasing utilization of the above groups will include:

- ▶ Broadening the scope of our recruiting efforts. This will include expanding our recruiting outlets and resources such as utilizing the Internet, Department of Labor, and community resources for job postings.
- ▶ Exploring diversity training and continue to monitor hiring process. AIP is looking into offering diversity training for hiring managers and supervisors.
- ▶ Examining and identifying internal candidates for open positions and career development. This will include continuing cross job training, development of skills, and promotion of existing tuition reimbursement program.

RESPONSIBILITY FOR IMPLEMENTATION

A. Executive Management Responsibility

As the representative of executive management, the EEO Coordinator has primary responsibility and accountability for implementing, directing and monitoring this Affirmative Action Plan.

1. Implementing the affirmative action programs set forth in this Plan, including the development of policy statements and related internal and external communication procedures to disseminate those policy statements.
2. Developing and supervising the presentation of our equal employment opportunity policy during the supervisory training and new employee orientation programs, which may include question-and-answer sessions for supervisors and employees answering their questions about this Affirmative Action Plan.
3. Designing and implementing an audit and reporting system that will accomplish the following:
 - (i) Measure the effectiveness of our affirmative action programs.
 - (ii) Indicate when remedial action is needed.
 - (iii) Determine the degree to which our goals and objectives have been attained.
4. Advising management and supervisory personnel on developments in the laws and regulations governing equal employment opportunity.
5. Serving as liaison between the Company and all enforcement agencies.
6. Identifying problem areas and establishing goals and objectives to remedy underutilization in major job groups, if any underutilization exists.
7. Conferring with community organizations representing women, minorities, veterans, the disabled and older workers.

8. Auditing periodically our on-the-job training, hiring and promotion patterns to remove impediments to attainment of the Company's goals and objectives.
9. Rating supervisory employees based, in part, upon their efforts and success in furthering the goal of equal employment opportunity, and informing supervisory employees of this evaluation practice.
10. Discussing periodically the Company's commitment to equal employment opportunity with managers, supervisors, and employees. During these discussions, the EEO Coordinator will stress the importance of affirmative action, as well as nondiscrimination.
11. Reviewing the qualifications of all employees to insure that minorities and women are given full opportunities for transfers, promotions and training.
12. Providing access to career counseling for all employees.
13. Conducting periodic audits to ensure that the Company is in compliance with federal and state laws and regulations requiring:
 - (i) Proper display of posters explaining the Company's obligation to engage in nondiscriminatory employment practices.
 - (ii) Integration of all facilities which we maintain for the use and benefit of our employees.
 - (iii) Maintenance of comparable facilities, including locker rooms and rest rooms, for employees of both sexes.
 - (iv) Providing full opportunity for advancement and encouraging minority and female employees to participate in educational, training, recreational and social activities sponsored by the Company.
14. Counseling supervisors and managers to take actions necessary to prevent harassment of employees placed through affirmative action efforts and to eliminate the cause of such complaints. Further, the EEO Coordinator will

counsel supervisors and managers not to tolerate discriminatory treatment of any employee by another employee or supervisor and to report all complaints or incidents to him.

15. Establishing an internal complaint system that will enable employees to discuss complaints with the EEO Coordinator whenever they feel that they are being discriminated against on the basis of race, color, religion, sex, national origin, disability or veterans' status.
16. Serving as liaison between the Company and community organizations representing minorities, women, veterans, the disabled and older workers.
17. Developing expertise and knowledge of equal employment opportunity guidelines and regulations in order to advise and update top management and supervisory personnel concerning developments affecting our equal employment opportunity program.

B. The Responsibilities of Supervisors and Managers

All supervisors and managers must share in the day to day responsibility for implementing the affirmative action programs set forth in this plan. Specifically, they must endeavor to:

1. Respond to inquiries about our Affirmative Action and Equal Employment Policy, after consulting with our EEO Coordinator.
2. Assist our EEO Coordinator during the investigation of allegations of discrimination.
3. Participate in recruitment and accommodation efforts designed to enable disabled individuals, disabled veterans and others to secure employment and to advance to positions for which they are qualified.
4. Ensure that all federal and state posters explaining the laws prohibiting discrimination are properly displayed.
5. Participate in the development and implementation of affirmative action programs.

DISSEMINATION OF EQUAL EMPLOYMENT POLICY

I. Internal Dissemination

The Company will take the following actions to disseminate its Affirmative Action and Equal Employment Policy, as appropriate, on a regular and continuing basis.

A. Including the Affirmative Action and Equal Employment Opportunity Policy statement in its policy manual and employee handbook, as published. A copy of our EEO Policy, which is contained in our Employee Handbook, is attached at the end of this section.

B. Meeting with supervisory personnel to explain the intent of the Affirmative Action and Equal Employment Policy and their individual responsibilities for its implementation. We conducted supervisory training for all management about equal employment opportunity, affirmative action and sexual harassment during Plan Year 1995 and have continued the training into Plan Year 1996. We have attached information relating to our supervisory training at the end of this section.

C. Scheduling special meetings with employees or using Company newsletters to discuss and explain individual employee responsibilities or opportunities under the affirmation action program. During the current plan year we will be conducting

training for all employees about our affirmative action program and
equal employment opportunity in the workplace.

D. Discussing our equal employment policy during any orientation programs we hold, at which time all new employees (and if applicable, transferred and promoted employees) will be advised of our commitment to affirmative action and equal employment opportunity. Our Affirmative Action and Equal Employment Opportunity Policy statement and policy statements affirmatively supporting the employment of minorities, veterans, the disabled and women will be explained during these sessions. During these orientation sessions a management representative from various areas of the Company, including Human Resources, explains the function of their department. Our Affirmative Action and Equal Employment Opportunity Policy statement and policy statements affirmatively supporting the employment of minorities, veterans, the disabled and women are explained during these sessions. We have attached at the end of this section an "Overview of New Employee Orientation Process", which includes a copy of our "New Employee Checklist," and addresses equal employment opportunity and affirmative action in the workplace.

E. Posting the Affirmative Action and Equal Employment Policy, along with all required State and federal informational posters, on our bulletin boards, and updating such posters as required. Our "Affirmative Action and Equal Employment Opportunity Policy Statement", "Invitation to Vietnam Era and

IDENTIFICATION OF PROBLEM AREAS (DEFICIENCIES)
BY ORGANIZATIONAL UNIT AND BY JOB GROUP

I. UNDERUTILIZATION

The EEO Coordinator conducted a Utilization Analysis for the 1996 Plan Year in which she compared the workforce representation of minorities and females to their statistical availability by job group. The Utilization Analysis led the Company to identify the following areas of underutilization:

Females are statistically underutilized in job groups 101 (Senior Managers) and 201 (Senior Professionals).

Minorities are statistically underutilized in Job Group 202 (Other Professionals Technicians).

The Company is addressing these potential problem areas by establishing goals which we will attempt to achieve through specific action oriented programs, which are described in the section of this plan entitled "Action Oriented Programs." Our Utilization Analysis and Goals are contained behind the tabs, so named, in this affirmative action plan.

II. ADVERSE IMPACT

To determine if our selection procedures have an adverse impact upon minorities and females during the first six months of our 1996 Plan Year, we conducted an adverse impact analysis upon our selection decisions. We compared the selection ratios of minorities and females to those of non-minorities and males, respectively, in the areas of hiring, promotion and termination. Through this analysis we discovered no areas for this time period of statistically significant adverse impact.

As a result of our adverse impact analysis, we examined each of the selection decisions that occurred in job groups where adverse impact was discovered as described in the Action Oriented Programs section of our plan. Furthermore, a full impact ratio analysis of our selection decisions and a narrative discussion of the legitimate business reasons supporting our decisions is found behind the "Jaar Analysis, Impact Ratio Analysis and Placement Analysis" tab.

III. IN GENERAL

In addition to the above, the EEO Coordinator will, on an annual basis, as applicable, identify potential problem areas in the total employment process, which may include review of the following areas:

- A. Composition of the workforce by minority group status and sex.

- B. Composition of applicant flow by minority group status and sex.
- C. Overall employee selection process including position specifications, application forms, interviewing procedures, test administration, test validity, referral procedures, final selection process, and other employee selection procedures.
- D. New hires, promotions, terminations, etc.
- E. Utilization of training, recreation and social events and other programs that are sponsored by the Company.
- F. Technical phases of compliance with laws prohibiting discrimination in employment and promoting affirmative action programs, e.g., retention of applications, notifications to subcontractors, etc.
- G. "Underutilization" of minorities or women in specific job groups.
- H. Lateral or vertical movement of minority or female employees occurring at a lesser rate than that of non-minority or male employees.
- I. The selection process eliminating a significantly higher percentage of minorities or women than non-minorities or men.
- J. Application and other preemployment evaluation forms or procedures not in compliance with federal or state law.
- K. Position descriptions inaccurate in relation to actual functions and duties of that particular job.
- L. De facto segregation, by race or sex, existing in job titles or job groups.
- M. Seniority provisions contributing to overt or inadvertent discrimination by minority group status or sex.
- N. Non-support of our affirmative action and equal employment programs and policies by managers, supervisors or employees.
- O. Minorities or women significantly underrepresented in training or career improvement programs.
- P. Lack of formal techniques for evaluating effectiveness of the programs set forth in this Plan.

27 April 1998

To: Theresa Braun, Director of Human Resources, and James Stith, Director of Physics Programs, American Institute of Physics

From: Jeff Schmidt, Senior Associate Editor, Physics Today

Subject: My 1998 performance review

I am writing to ask that my 1998 performance review be redone. Physics Today editor Stephen Benka wrote the review under the direction of Physics Today publisher Charles Harris. I discussed the review with Benka, who, after consulting with Harris, refused to make any of the revisions that I requested. Therefore I am appealing to you to produce a new review.

The review was not conducted in accord with American Institute of Physics policy or procedures, and the result is not a fair assessment of my work as a feature articles editor at AIP's Physics Today magazine. I am asking you to produce a new review not just in the interest of accuracy, but also as a necessary affirmation that in the future the American Institute of Physics will treat its employees fairly.

The review lowers my performance rating from last year's "4" ("Exceeds Job Requirements") to a "3" ("Meets Job Requirements") even though this year I did more work and more innovative work. Producing feature articles for the monthly magazine is a team effort, and I think that the many staff members with whom I work will testify that my work is better than average.

The biased review that I received is punishment for my organizing activity at the magazine. It is one of a number of recent reprisals for -- and moves to stop -- such activity, in which I have played a leading role in the interest of both the magazine's staff and the physics community. The central retaliatory feature of the review is that it makes what it admits are "new demands," which amount to a sharp increase in my workload.

I have had 17 performance reviews since I began working at Physics Today in March 1981, but until now I have never needed to write a response to one. This time, however, not only is the review inaccurate, but my supervisor, editor Benka, presented it to me with the attitude that performance reviews at AIP are not done with employees, but are done to them. This violates both the letter and the spirit of AIP policy. He acted as if he were not permitted to change the review in any significant way, and so his discussion of its contents was only pro forma.

In this memo I will first describe some of the ways in which the review is inaccurate, and then I will explain how

it is a reprisal for my organizing activity and part of a series of recent attempts to stop me from engaging in any further collective activity at the magazine.

Review inaccurate

I will go over every sentence of the performance review and show how the review plays down or completely leaves out my accomplishments while contriving deficiencies and playing them up. The review has four sections: three sections focusing on my major areas of work responsibility and one section of additional comments.

Article editing

Concerning my article editing work, the review states that "Jeff's articles are generally ready on time and are often early." This plays down my accomplishments and does so deliberately, because management keeps records of deadlines and work-completion dates and is fully aware of what I have done in this regard. The words "generally ready on time" must be changed, because my articles were always ready on time and never delayed an issue of the magazine. And the words "often early" must also be changed, because my articles were almost always early and were often very early.

This is not to say that management can reasonably hold me responsible for the final completion dates of the articles that I work on. They cannot, because the publication process depends upon the work of the magazine's editor and many coworkers, over whom I have no authority. What my review should note is that I always did my part as fast or faster than can reasonably be expected, and certainly much faster than average. At one point during the year, for example, I had two feature articles ready to go to the printer more than a month before the deadline (discussed further in the following two paragraphs). As far as anyone can remember, this had never been accomplished before at Physics Today. My articles came close to the deadline only when the editor failed to meet his deadline for obtaining the articles and giving them to me to edit. I ask that you rewrite this part of my performance review and increase the numerical rating to reflect the resulting more accurate appraisal. I am asking you to do this not just to make my review more accurate, but also to assert that it is not AIP policy to begrudge an employee praise when it is due, even if AIP has a grudge against that employee.

On the issue of deadlines, I would like AIP to use its own performance as the standard for comparison. AIP gave me my performance review more than five weeks late, missing its mid-February deadline and then not even completing the review by the middle of the following month. Benka dated my review 12 March, signed it on 23 March and gave it to me on 24 March.

One big reason that I did more work this year than last year was because management stated that it wanted the magazine to have a backlog of feature articles that were edited and completely ready to be sent to the printer. I supported this goal and produced such articles, but this unprecedented accomplishment is not mentioned in my performance review. Management is fully aware of my accomplishment, as evidenced by the fact that they praised it at a staff meeting.

Working way ahead of the deadline has the potential advantage of avoiding some major inefficiencies (described in the following paragraph), but doing so turned out to involve extra work, because although management asked for and praised the result, they did not support the effort while it was underway. It was left to me to bring about the changes in the workplace necessary to work ahead. The editor consistently maintained a crisis mentality, always giving priority to work for the next issue -- which he always worried would be late -- over work for future issues. Because the work of most employees on a forthcoming issue doesn't end until around the time that the issue goes to press, the editor, with his crisis priorities, never deemed it reasonable to work on later issues. I was able to accomplish management's goal of completing work ahead of schedule only by working directly with the staff team that actually does the work (Rita Wehrenberg, editorial assistance; Paul Elliott, copy editing; Elliot Plotkin, art work; Judy Barker, proof reading; Carol Lucas, photo permissions), and carefully avoiding coming to the overly insecure editor with questions of work priority. I ask you to add this accomplishment to my performance review and raise the numerical rating to reflect the resulting less biased appraisal. I ask you to do this not only to make my performance review more accurate, but also as a way of saying that AIP does not condone biased appraisals of employees.

Another big reason I did more work this year was the inefficiency caused by the magazine's periodic exhaustion of its supply of feature article manuscripts that are ready to edit for publication. It is Benka's responsibility to obtain articles for the magazine. The shortage of articles resulted in a very uneven work flow and forced me to edit some articles close to the deadline, which often meant editing in parallel with the author's making revisions. It is easy for the editor to say "just work in parallel," but such work often necessitates reediting material that the author changes and discarding edited material that the author removes, and a host of other problems. The shortage of articles led me to write to the editor in the middle of the year asking for more work. (See attached memo of 18 August 1997.)

The numbers given in the performance review are all wrong. The review says that this year I "was asked to produce 16-18 articles." In fact, the agreed upon rate was initially 16 per year, not "16-18," the precise meaning of which is not at all clear since there presumably is no upper limit. Benka and I later in the year agreed to reduce the annual rate to 14 and increase the amount of work that I do in areas other than editing, yet the number "14" never appears in my performance review. I ask you to correct this.

As far as the article editing part of my job goes, my production rate is supposed to be measured by the number of articles published in the magazine in the issues March 1997 through February 1998, as is written at the top of the review form. During that year I edited 13 articles (Mahan, Ferguson, Crabtree, Crowley, North, Parsegian/Austin, Harris, Soulen, Libicki, Perl, Ross, Riordan, Mourou), one of which (the Parsegian and Austin combination article) should count as more than one because making it happen involved a lot of extra work. (More about that article below.) Although this is less than the agreed upon goal, it should be deemed acceptable because of the shortage of articles (AIP should not hold employees responsible for doing work that is not available to do) and because of the extra work caused by that shortage and by management's lack of support for working ahead. Please correct the accounting in this part of the review.

The review gives an incorrect reason (a personal reason) for the mid-year change in my job description. The reduction in my article editing goal from 16 to 14, and the corresponding increase in my work following up with authors on articles that have been solicited, was prompted by the magazine's shortage of articles. On 18 August 1997 I gave Benka a note (attached) asking for more articles to edit. On 19 August 1997 he answered with a very defensive note (attached) blaming me in part for the magazine's shortage of articles and at the same time denying that there was any such shortage. He claimed that I was in part to blame, because following up on solicited articles was part of my job. On the same day (19 August 1997) Benka secretly altered my job description, adding truth to his claim that solicitation follow-up was a significant part of my job. When I discovered the change, he and I discussed it and I agreed to make solicitation follow-up a bigger part of my job. I asked him to write me a note saying that my job description had been changed (see 25 August 1997 note from Benka, attached).

The change in my job description, while made official in the middle of the year, should be considered retroactive to the beginning of the year, because the problem it addressed was long-standing and I had long before addressed it on my own: The shortage of articles to edit had already

led me to shift some of my work from editing to solicitation follow-up. Solicitation follow-up is an area in which I make valuable contributions to the magazine. This often time-consuming work includes giving feedback to authors and working closely with them to develop greatly improved articles for the magazine.

Finally, on 2 September 1997 I gave Benka a note (attached) explaining that solicitation follow-up was not the weak link in the magazine's feature article operation. That note, the contents of which Benka never disputed, is an important part of this appeal about my performance review, and as such, I ask you to read it. Please remove from my performance review the incorrect reason given for the change in my job description, and add a statement concerning the magazine's shortage of articles, because it played a crucial role in my work last year.

My work on the Parsegian/Austin combination article is one of many examples of how my performance review leaves out major contributions that I have made to the magazine (while carefully including minor, largely contrived, deficiencies). Physics Today was planning to publish in its July 1997 issue a manuscript by V. Adrian Parsegian of the National Institutes of Health, but the article received a highly negative appraisal from the magazine's external reviewer, Robert H. Austin of Princeton University. This caused a crisis, because the magazine had no article to substitute -- having completely run out of articles -- and because there was no time for Parsegian to make the extensive revisions that were called for by the reviewer.

Based on the nature of Parsegian's article, the nature of Austin's review and my confidence in the critical abilities of the magazine's readers, I suggested a solution: Publish the article and the review. This was unprecedented at Physics Today, but the editor followed my advice, in part because no other solution was apparent. I edited the combination article and review and handled the delicate and protracted negotiations between Parsegian and Austin, who did not trust each other. The solution was innovative, the result was outstanding and the magazine survived a crisis without damage. In fact, the result was better than it would have been had there been no crisis, because the crisis allowed the magazine to break with tradition. Yet the managers, who seem this year to have developed photographic memories for negative things (real or contrived), have completely forgotten about my special contribution to the magazine during the Parsegian crisis. I ask that my work on the Parsegian/Austin article be described on my annual review, as an example of my valuable advice and above-average work. And I ask that my numerical rating be raised to reflect the new, unbiased text.

You might think it strange that even though the review states that I edited enough articles during the year, it

lists the names of some articles that I didn't edit -- articles that were never assigned to me and that I was not expected to edit. That list appears on my performance review as a defensive measure by the editor -- to bolster his claim that under his editorship the magazine does not experience shortages of articles. Soliciting a sufficient number of articles for the magazine is the editor's job, and so the appropriate home for arguments that he has succeeded is the "Employee's Comments" section of his own performance review. Please remove the sentence and its negative connotation from my performance review. (For a discussion of how the list is not even what it claims to be, see the fourth paragraph of my memo of 2 September 1997.) Such lists do not appear on the performance reviews of other employees. The performance reviews of Physics Today news writers, for example, do not contain lists of the countless news stories that they could have written but didn't.

The review lists three articles that I edited (Perl, Crabtree/Nelson, Mourou) and claims that the quality of my work varied. In fact, because of my own standards I do a quality job on everything I do. There is, of course, no objective measure of the quality of editorial work. Articles are inherently different and hold a different appeal to different readers. In my performance review the editor implies that praise from authors is one measure, but he fails to note that we received praise from the authors of all three articles. Martin Perl, winner of the 1995 Nobel Prize in Physics, wrote to me and said "Thank you for changing my ugly duckling of a manuscript into a beautiful swan. You have done a wonderful job." I have attached a copy of his note along with a note from George Crabtree of Argonne National Laboratory praising our efficiency, competence and high production standards; Mourou delivered his praise in a telephone call.

It is true that the changes that Benka mentions making in the Mourou article were improvements that other staff members or the author might not have made at one of the later stages in the processing of the article. However, it is wrong to use this as the sole factor in judging the quality of work on the entire article, which would have been excellent even without Benka's improvements. And it is even more wrong to use it to judge an employee's entire year of work. Stephen Benka knows this. He knows, for example, that AIP management will not judge all of his excellent work on the Mourou article solely by the fact that he tried to introduce a mistake in the article's opening paragraph -- where he crossed out "30 angstroms" and wrote in "300 nm" and had to be corrected by the Article Editor. And he knows that his supervisors certainly will not judge his entire year of work in part by this mistake. He would see mentioning it on his annual performance review as petty, mean-spirited and sure to make team work impossible because it would give the impression that no error is too small for

the people that he works with to silently note and use against him months later. Please remove from my performance review the entire subjective sentence about the three articles.

Solicitation follow-up

Concerning my solicitation follow-up work, the performance review understates the quality of my work and rates me only slightly above average. The only activity mentioned is that I "regularly nudged authors and reviewers whose items were pending." This is actually the smallest part of solicitation follow-up work. The biggest part, at least for the articles that I work on, is giving detailed feedback to the author and working with the author to develop a much better article. I often go way beyond the call of duty, taking extra time to work closely with authors to improve the final result. I am prepared to supply written evidence showing that my work in this area is exemplary. Please change the review so that it more accurately portrays my work in this area, and raise the numerical rating from the present stingy "3.5."

Advice

Concerning the advice that I offer on editorial and other matters, my supervisors have suddenly (that is, within this review period) started looking for ways to prove that the advice I offer is bad. Coming up empty-handed, they have contrived two examples, one of which is a new, negative interpretation of advice I gave in an earlier review period. My 1998 performance review says, "Jeff's reviews of manuscripts have been completed more promptly than in the past, although they were somewhat less helpful." It is simply not true that my advice was less helpful this year. My comments on manuscripts often went beyond the minimum requirements and spelled out in detail what should be done to produce a publishable article.

As evidence that my advice is less helpful, the performance review gives only the following example, which is presumably my most deficient piece of work in this area for the entire year: "In his review of one Letter to the Editor, for example, he showed questionable judgement in his assessment of the physics competence of the authors of the Hubble Deep Field article (April '97)." There is absolutely no truth to this charge; its only value is that it reveals the bias of those who made it. I demand that my work on this letter be evaluated by an unbiased individual. James Stith, I would like you to be that individual, not because it is your job to handle appeals from Physics Today, but because your long-standing interest and expertise in physics education qualifies you to evaluate my work on this letter. All work on the letter was done in writing, and so you have a 100% complete record to review (attached). I challenge

you to find anything in my work on the letter for which I should be punished.

Here is a five-step summary of the facts of the case:

1. I edited an article by Henry Ferguson and two coauthors for the April 1997 issue of Physics Today.
2. Robert Weinstock, an emeritus professor of physics at Oberlin College, submitted a letter to the editor saying that he didn't understand how astronomers could look back more than half the age of the universe, as a photo caption in the article said. "This claim seems strange to me," wrote Weinstock, "for radiation emitted so long ago must have had its source so close to Earth at the moment of emission -- according to the generally assumed big-bang origin of the currently expanding universe -- that it would have reached Earth [long ago]." He ended his letter by saying that "If there is something wrong with my analysis, I shall be grateful to have it explained to me."
3. I thought Weinstock asked an intriguing question and that many of our readers would also be grateful for an explanation (and would value a magazine that gave them such explanations). Here, in its entirety, is my review of the letter: "I think a lot of our readers would appreciate an answer to the question that Weinstock raises. I suggest that we publish a shortened letter (see enclosed edited version) along with an answer from Ferguson." (The parenthetical words were part of my review.)
4. To my disappointment, the response from Ferguson and his coauthors was based completely on equations, with no explanation of what was going on. I wanted a physical explanation, not a mathematical one. So I recommended that we ask Ferguson & Co. for something very simple. Of course, as good science writers and teachers know, an explanation that is simple and without equations is sometimes much more difficult to produce. Sometimes when scientists don't have a Feynman-style intuitive understanding of a particular issue, they take refuge in equations. That is, sometimes authors don't understand the physics of every item that they report in their articles. I have encountered this countless times over the years while questioning authors so that I could clarify something in their articles. Sometimes they say: I don't know, my coauthor wrote that part of the article. Or they say: I don't know, I got that from So and So's paper in such and such journal. So in my review of Ferguson's letter I warned that this was one possible reason why we got only equations. I figured that if we were aware of this possibility, then we wouldn't go back to the authors again and again in a futile effort to get something that they were not prepared to supply. Here, in its entirety, is my review of Ferguson's letter: "Weinstock's question should get a physical explanation as an answer, not a

mathematical one like this. I say drop the mathematical one, don't just add the physical one to it. Perhaps ask Ferguson & Co. to write what they would say to a high-school student (or radio audience) who noticed this seeming contradiction. One possible reason that Fergie & Co. answered as they did is that they don't really understand the physics."

5. Benka rejected my suggestion that we ask Ferguson for a simple answer, and, ironically, punished me seven months later for not being fully confident that Ferguson could have provided such an answer. Because my advice was rejected, Physics Today readers ended up seeing no question from Weinstock and no answer from Ferguson.

You can see clearly now that while my performance review says, "he showed questionable judgement in his assessment of the physics competence of the authors," I in fact never made any assessment of the physics competence of the authors, positive or negative. Even if I had made such an assessment, the Physics Today managers did not and cannot accurately claim that the advice it led me to give was anything less than excellent. Their relentless search to find fault with my work, and their twisted and biased evaluations of my work when it contains no real fault, raise serious questions about their professionalism as managers and certainly disqualify them from judging my performance. If you judge that I did good work on the letter, as I claim, then I ask that my performance review mention that work as an example of my routine interest in serving the magazine's readers, and that the numerical rating on my review be raised to reflect the new, unbiased assessment. I ask AIP to make these adjustments not just to make my performance review more accurate, but more importantly as an urgently needed announcement that AIP will no longer use performance reviews to punish employees who raise troubling workplace issues.

As with every other part of my performance review, Benka refused to make any changes in this part of the review when I pointed out its inaccuracy. I asked him if he had any other examples of my supposedly bad judgment. All he could think of was something from an earlier review period: my suggestion that Physics Today try to get G. Pascal Zachary to write an article about Vannevar Bush. Zachary is a journalist -- one of the best in the country, I think -- as well as a history of science scholar. I had learned that he was writing the first ever biography of Bush, who was the first presidential science advisor and an individual who played a key role in shaping the federal science policy that prevailed for decades after World War II. After I proposed this article at a staff meeting, Physics Today publisher Charles Harris spoke about it with AIP history division postdoc Joel Genuth, a friend of Harris's at the time. I spoke with Genuth, too. Genuth advised against the article,

because Zachary was not a mainstream thinker -- quickly adding that he (Genuth) was "no slouch" and could write the article for Physics Today. At a subsequent staff meeting, I reported positive evaluations of my proposal from more established science historians and argued that our readers could handle Zachary's point of view. But Harris stuck with Genuth's review, and so that was the end of my proposal.

Now, more than a year later, during the discussion of my 1998 annual review, Benka has put a new, totally negative spin on my work on the Zachary proposal. To my surprise, when he mentioned my judgment in the Zachary case, Benka showed no sign of embarrassment, apparently completely unaware that Zachary's book was recently published to widespread praise and attention. The vast majority of books are not reviewed anywhere, but Zachary's Endless Frontier: Vannevar Bush, Engineer of the American Century (The Free Press, 1997) was both widely and positively reviewed by well-respected experts writing in major publications. (Please read the attached reviews.) Apparently, the official Physics Today line now is that Zachary managed to hoodwink major American publications and experts -- but not Physics Today. Again, because my advice was not followed, Physics Today readers missed out on what surely would have been an interesting article. Yet I am the one whose judgment is being questioned -- for reasons that I will explain below.

I ask that my performance review be corrected so that my judgment, and its value to the magazine, is discussed positively rather than negatively. I would like my work on the Zachary proposal to be mentioned as an example of the fact that I offer ideas of merit even though I am not expected to be a major source of article or story ideas. I ask that the numerical rating be raised to reflect the new positive evaluation, and that the rating be above average to reflect the fact that I offer more than the required advice. I request that AIP make this change not just to make my performance review more honest, but more importantly as an implied announcement that AIP will no longer prejudice performance reviews against employees who raise awkward workplace issues.

Additional comments

In the handbook that is given to all employees, the American Institute of Physics promises that the annual performance review will feature a discussion of "mutual goals." (Employee Handbook, page 18.) Without explanation, this year Benka followed neither the letter nor the spirit of this policy, and didn't even pretend to be interested in what direction I might want to go in my work at AIP. The discussion was unlike anything I have experienced in previous years. He simply announced a big change in my job description -- an increase in my workload by as much as

three months' worth of work per year -- and discussed it as if he were giving orders to a machine. Over the years my job description has changed many times (the most recent change being on 25 August 1997), but never by unilateral management dictate, without discussion and mutual agreement. For reasons that I will explain below, I think this change, and its unilateral imposition in violation of American Institute of Physics policy and usual practice, is punitive.

The written review accurately calls the change "new demands." But it inaccurately implies that other Physics Today staff members are meeting such new demands. My coworkers have experienced no such major increases in their workloads either voluntarily or by management order (except in one or two cases in which individuals have voluntarily renegotiated their job descriptions, job titles and salaries). My coworkers and I work hard and cannot reasonably be expected to take on additional work. Among my coworkers who have not stepped up their workloads are Gloria Lubkin, Barbara Levi, Bert Schwarzschild, Charles Day, Irwin Goodwin, Carol Lucas, Toni Feder, Jean Kumagai and Warren Kornberg.

The 25 August 1997 agreed-upon change in my job description reduced my article editing work to 70% of my time (14 articles per year) so that I could increase my work in other areas, which I have done. Now, just a few months later, AIP is using my performance review to arbitrarily increase my annual article editing load to 18 -- a 28 percent jump. The performance review also changes my job description to add a significant load of clerical work (keyboarding) to my job for the first time in my 17 years at the magazine. Other editors who work better on paper (for example, the book review editor and the copy editor) are not being told to change the way they work or to take on the associated clerical work. This clerical work, which includes keyboarding the dozens of changes made by the copy editor, could take as much as a few days per month, depending upon the article. It would lower the overall efficiency of work at the magazine, because the time spent on clerical work would, of course, reduce the time available to do other work such as article editing and article solicitation; instead of paying \$15/hour for clerical work, AIP would pay \$30/hour. Like many people, I do better work on paper than on a computer screen (and a long-standing back problem precludes long sessions sitting in front of the screen anyway). I ask that support staff be made available once again. Even if management had a valid reason for adding clerical work to my job, that reason cannot be a new one. What is new is that, for reasons discussed below, management has suddenly gotten "on my case" and is taking a hard-line on every issue.

In Benka's pro forma discussion with me about my performance review, he never asked about the direction in

which I would like to go on the job. If I were able to take on additional work, I would like that additional work to be somewhat different from what I am doing now, to provide some variety and to contribute to the magazine in a different way. When I explained this to Benka, he acted uninterested and reasserted his uninspiring, unilaterally developed plan for me, which is to do the same work, only a lot more of it.

Reprisal and repression

The American Institute of Physics is making a strong effort to prevent Physics Today staff members from pursuing workplace grievances in an organized way. Problems are to be discussed with managers on an individual basis only, we have been told. (Message transmitted to staff through warnings to Graham Collins and in other ways.)

Physics Today staff members have many legitimate concerns. Many believe, for example, that the company fails to provide conditions of employment appropriate for professionals. According to my philosophy, if there is a problem, then everyone who is in a position to address it has a moral obligation to do so. Thus, problems at the magazine are everyone's business -- the business at least of everyone who works there. Even though management doesn't see it that way, I have always tried to do whatever I could to help solve problems that arise, whether or not they affect me directly. You, too, are in a position to do something about the problems at the magazine, and therefore I think you have an obligation to do so, for the sake of both the magazine's staff and the physics community.

During the discussion of my performance review, Physics Today editor Stephen Benka condemned my organizing activities at the magazine and said bluntly that such activity "is not going to be tolerated anymore." He characterized the staff actions in which I have played a leading role as nothing more than "disruptive," rejecting my view that the source of the problem is management's failure to address staff grievances. A workplace in which unity is discouraged, as it is now at the magazine, is disruptive. The low morale, the inability to confront problems, the loss of talented and dedicated staff due to a love-it-or-leave-it atmosphere -- these consequences of management policy are disruptive and wasteful.

Physics Today publisher Charles Harris has made it clear to me and to many staff members (names withheld) that our activities have infuriated him. And American Institute of Physics Executive Director/CEO Marc Brodsky has characterized some of my activities, presumably reported to him by Harris, as "counterproductive" (20 March 1998). It is clear that Benka's hard-line attitude toward me is an attempt to redress Harris's and Brodsky's grievances with

the staff -- in particular, with those staff members whom Harris has identified as ringleaders. (Harris's ringleader theory insults the staff, because it implies that staff grievances arise not because of real problems in the workplace, but because an evil few have corrupted the minds of happy but gullible staff members and led them astray like children.)

In this memo I will be open about my organizing activities at Physics Today, because the problems at the magazine call for an organized response and because the physics community strongly supports physicists' right to organize without fear of reprisal. The latter point is evidenced, for example, in the community's many years of support for Soviet physicists who were punished for organizing, and in its concern today for physicists in other countries who face similar repression. In any case, freedom to address workplace problems is a necessary component of a truly democratic society.

Management is attempting in two ways to prevent the Physics Today staff from pursuing collective grievances -- by punishing those who speak out the most and by maintaining an increasingly repressive workplace atmosphere. My lower performance rating and subjection to an arbitrarily revised job description that makes "new demands" are punishments for taking up staff grievances. What follows is a discussion of a few of the collective staff activities in which I played a leading role and for which management criticizes me. Included is a discussion of some of the repressive measures that management has taken in response to those activities. The discussion should make it clear that my review is only one part of a series of recent attempts to stop me from promoting or engaging in any concerted staff activity.

1996 retreat

During the discussion of my performance review, Benka criticized me for my activities around the 19-20 November 1996 Physics Today retreat. Before that two-day meeting, I and some coworkers (names withheld) developed and distributed to the entire staff a list of changes that we wanted made at the workplace. We presented these requests in the form of a proposed agenda for the retreat. Fearing reprisals for making requests that might not please management, we did not disclose our names. However, the fact that I played a leading role was known to all. Job security was our highest priority, and so our demand for that topped our list. (See item 1 in attached document of 15 November 1996.) Other requests included staff involvement in workplace dispute resolution (item 4), better distribution of job tasks (item 5), affirmative action in hiring (item 8), and conditions of employment appropriate for professionals (the other items).

Salary equity

I worked with other staff members to demand pay equity at Physics Today. On behalf of those of us who were pushing for this, I told the Physics Today advisory committee at their 4 October 1996 meeting that the large salary differentials among the staff were not only unfair, but also divisive and bad for morale and productivity. I raised the issue at various staff meetings as well. Management was not pleased by the pressure we applied, in part because it forced them to give a staff member (name withheld) a special 25% salary increase, beginning on 1 June 1997.

Affirmative action

Management's anger at me increased dramatically, and never subsided, when I worked with Jean Kumagai and other staff members (names withheld) to assert the need for equal opportunity and affirmative action in hiring at Physics Today. We raised the issue when Ray Ladbury left the magazine, creating an opening on the editorial staff. (His replacement, Charles Day, started work on 2 June 1997.) I spoke out strongly on the equal opportunity and affirmative action issue, because Jean and I and the others didn't think Physics Today or AIP management took it seriously. Our concerns were largely ignored, and so, later in the year, we decided to bring the problem to the attention of the Physics Today advisory committee at its annual meeting, held 17 October 1997. On behalf of the concerned staff members (names withheld), I brought the matter to the committee's attention.

One week later, on 24 October 1997, American Institute of Physics Executive Director/CEO Marc Brodsky called me and said that I had made "a very, very serious charge." (Detailed notes available.) He directed me to meet with him and defend my charge, and I did so on 5 November 1997. At that meeting I gave Brodsky a note summarizing the important points. Rather than repeat those points here, I am attaching a copy of the note. (See note of 5 November 1997.) That note is an important part of this appeal about my performance review, and so I ask that you read it.

At my meeting with Brodsky I also pointed out that AIP had failed to conduct the affirmative action training that it promised to conduct in its 284-page "1996 Affirmative Action Program for American Institute of Physics." (See attached excerpts.) Among the many promises that AIP makes in that 1996 document is that "During the current plan year we will be conducting training for all employees about our affirmative action program and equal employment opportunity in the workplace." I pointed out to Brodsky that AIP did not conduct the promised training. He countered by saying that he was pretty sure that he mentioned affirmative action either at the one-hour question-and-answer session that he

held on 20 June 1996 or at the Q&A meeting that he conducted for employees at AIP's facility in Woodbury, New York. (I recall no such mention at the 20 June 1996 College Park meeting.) He indicated that this mention was the promised affirmative action "training."

Brodsky said he would look into affirmative action at Physics Today and tell me what he found. After a 4.5-month investigation, he met with me on 20 March 1998 and reported that he found that Physics Today's affirmative action program was doing very well. He said he judges the program by its results. (This was mysterious, because as of 20 March 1998, the Physics Today staff in the College Park office was all white; out of a staff of 18, the magazine had only one minority employee, working from New York.) I asked again about the promised affirmative action training. This time he said he was sure that he had mentioned affirmative action at both 1996 Q&A meetings, and he again indicated that such mention was the promised affirmative action training. After extensive questioning, he said that such mention was "part of" the promised training. I asked him when the rest of the training would be done, and he promised to look into that. In the end, I told Brodsky that we still believe our concerns to be well founded and that we are disappointed with his response. Apparently in Brodsky's view, however, the upshot of what happened is that I leveled serious, totally unfounded charges at AIP, and he is not happy about that.

1997 retreat

Management's anger at me increased yet again (and has not decreased since) when I helped raise staff concerns before and during the 25 September 1997 one-day Physics Today retreat. Before that meeting, I played a leading role in producing a list of proposed agenda items that represented a few of the many staff concerns. A majority of the staff supported it, and half of the staff signed it. (See attached e-mail message of 18 September 1997.) The top item on that list was a request for greater staff participation in decision making. The days leading up to the meeting saw much debate between management and many staff members over the meeting agenda, which management was formulating. Harris became upset that the staff wasn't embracing his agenda, and he began treating me and my coworker Graham Collins as ringleaders on the staff side, apparently becoming permanently angry at us.

At the retreat itself I asked if staff members could ask questions. Harris said no. I then said that I thought that we should be allowed to ask questions. Harris angrily said "No, That's an order!" Some days after the meeting he explained that he thought my request for the right to ask questions was another attempt to promote the staff agenda. At the retreat and in subsequent weeks, a number of brave

coworkers openly criticized Harris for the way in which he shut me up.

Gag order

After the retreat Harris put a gag order on me, handing me a written "notice" that implied that I would be fired the next time I said anything that Harris considered to be "counterproductive." (Document dated 26 September 1997 withheld.) This outraged many of my coworkers, who saw my forced silence as against their interest. They openly criticized the gag order, forcing Harris to rescind it. (Electronic mail message of 2 December 1997 withheld.) He did so reluctantly and without any decrease in his anger toward me.

Appeal to advisory committee

The gag order was just one of many management actions that strongly discouraged staff members from raising grievances of any sort. In an effort to get this chill lifted, a number of staff members (names withheld) decided to appeal to the Physics Today advisory committee at its annual meeting on 17 October 1997. We made our appeal to the committee, which reports to AIP's top management, in writing (memo of 17 October 1997 withheld) and in individual oral presentations. Our written note was titled, "Freer Atmosphere Needed at Physics Today" and began, "At Physics Today there is an increasingly repressive atmosphere that discourages staff initiatives...." The memo described how Physics Today staff member Graham Collins had also been warned about speaking up about workplace problems. It contained the following paragraph: "Both Jeff and Graham have been outspoken about problems that many of us see at the magazine. We feel that the lecture to Graham and the written notice to Jeff both contribute to a repressive atmosphere at the magazine and restrict all of us. We hope the advisory committee will do whatever it can to get these warnings retracted, and to remind the PT managers that repression is counterproductive. Such steps would go a long way toward diminishing the fear that staff members now associate with trying to openly address problems at the magazine."

Harris has harshly criticized me for my leading role in the presentations to the advisory committee, telling me and others (names withheld) incorrectly that I tried to get him fired. He sees this as an unforgivable offense that obligates him as a matter of manly honor to fire me or eventually drive me out and that gives him the moral right to do so by any means. Those means include steps that appear honest to outsiders but are not -- such as the present performance review, which imposes an unattainable goal that can be used against me a year from now when it has

not been met. When I explained to Harris that neither I nor the other staff members involved tried to get him fired or even wanted that to happen, he replied that I was either naive or lying. (I still do not want him fired, but I can no longer speak for others on this point. Respect and support for Harris by other staff members, including some not involved in our collective activities, have deteriorated sharply.)

Ban on my private conversations

In pursuit of his agenda, Harris has evidently given Benka license to go after me and other perceived management enemies on the staff. I will briefly describe here a recent example. (A more detailed account is available.) At about 6 pm on Wednesday 28 January 1998, I was in my office talking to my coworker Toni Feder on the telephone when Benka opened the door and asked rudely and sarcastically if I was talking to one of our authors. I said, "No, I'm talking to a coworker, Toni." He acted as if he already knew that. He stepped further into my office and said that he wanted in on our conversation. This was unprecedented and frightful. I switched Toni to the speakerphone and told her that Stephen Benka was here and wanted to be in on our conversation. She sounded equally shocked. Benka suggested that she walk over from her office to mine, and she said OK. I then walked out of my office and into the open area of desks just outside, and Benka followed. I did this to make room for Toni and to get some physical distance between myself and my supervisor, who was clearly behaving very strangely.

After Toni arrived, Benka asked us what we had been talking about on the telephone. I thought his question was way out of line, but I answered it anyway: We had been discussing the May 1998 50th anniversary issue of Physics Today. But after giving that short answer, I said that the important question is why he was trying to barge in on our conversation.

He answered by announcing that Physics Today management is forbidding all private conversations between staff members at work. From now on, all conversations between staff members must be open to management supervision, he said. When I asked him why, he referred to the organizing activity that took place last year and said that he doesn't want that to happen again. This smelled like a retaliatory and repressive policy aimed primarily at me, and so I asked him whether or not it applies to everyone. He said it does. I didn't believe him (but I didn't say that I didn't believe him), and so I pressed him three or four times to say whether or not he was going to announce the new policy to the rest of the staff. His final statement was that he knows that I want to know that.

The policy was never formally imposed on the rest of the staff, of course. But news of management's anger at private conversations spread quickly throughout the staff (yes, by way of private conversations). Even though the totalitarian policy officially applies only to me and Toni, it has put a chill on everyone's expression and has contributed to the repressive atmosphere at Physics Today.

Physics Today loses Graham Collins

In this memo I have for obvious reasons focused on my own case. But I don't want to leave the impression that management is critical only of me. In fact, they target any employee who speaks out about workplace problems. My most outspoken coworker, Graham Collins, was also the subject of a gag order and other reprimands for saying what many on the staff were thinking but were afraid to say. (Graham's gag order and mine were lifted at the same time.) I won't explain here how management irresponsibly made leaving the magazine Graham's best option. The details are available elsewhere. But with permission from Graham and all involved, I am attaching a copy of a note to Graham that I helped write after he submitted his resignation. (See attached note of 16 March 1998; authors' names withheld.) Please read the note as an integral part of my performance review appeal, as it contains a number of important and relevant points not made elsewhere.

'On my case'

As I mentioned above, management is now "on my case," and so my work is now subjected to greater scrutiny. Without precedent, the magazine's management recently examined and criticized some of my work before I completed it. (That was my work on the first of the five decade sections for the May 1998 50th anniversary issue of Physics Today.) Ever since the 1997 retreat, Physics Today publisher Charles Harris has given me the impression that I am being monitored. After the retreat he attended almost every magazine department meeting that I attended -- meetings that he had only rarely attended in the past. After some meetings, he commented privately to others about my performance.

Your moral responsibility

Physics Today's new love-it-or-leave-it policy, mentioned in the 16 March 1998 note to Graham, implies that the magazine's problems originate in the staff. Keeping the focus on the staff is not simply a harmless way that management diverts attention from itself, but is extremely costly. In the short time since Graham submitted his resignation, editor Benka's assistant Susan Funk has quit in frustration, and publisher Harris's assistant Carol Lucas has resigned. The loss of experienced staff, the

discouraged state of many of those who remain, the repressive atmosphere's toll on creativity -- in general, the frustration of those who want their job to be more than a simple exchange of time for money -- in these and other ways current policy wastes the resources of the physics community. You have a responsibility to undo the current widespread cynicism at Physics Today by making staff-initiated change possible.

S 002121

18 August 1997

Steve --

As I have noted in many conversations and memos over the years, I work most efficiently in my job of feature article editing when I have articles at all stages of development. That means, for example, some articles that have just been solicited, some that have been submitted and reviewed, and some that have been revised by the author and are ready to edit.

As you know, our supply of articles in the last category has followed a "feast or famine" pattern -- mostly famine. This has held down my productivity to the point where I cannot afford to take the full 30-day vacation that I recently requested (and that you approved) and still meet my annual article editing goal. So I am thinking about cutting that vacation in half, perhaps, and using the rest of my vacation time at some later date. I won't be able to work out the details until some articles in the last category trickle in and I can draw up a schedule.

As of today, we have received neither of the two manuscripts that I am going to edit for the December issue. I would be working on them now if we had them. The Riordan manuscript, for example, is not expected to arrive until around the time I had planned to go on vacation. And I have no articles that I can edit now for issues following December. I would like to edit two articles for the January issue and two for the February issue, but I will not be able to do that under our usual famine conditions -- I will need to have the manuscripts much earlier than I have been getting them. If today I had four manuscripts ready to edit for those two issues, I could work on all four simultaneously, using my time to greatest advantage. I think you will agree that the magazine should be in a position where such productivity and advance work is routine.

Given the status of the December manuscripts, a 30-day vacation as planned would compromise my ability to edit two articles for that issue. I would like to take a shorter vacation and continue working at home much of the time, as long as that continues to work well. Please let me know if that is OK, and in any case please see how soon I can have four articles that are ready to edit for the January and February issues.

A handwritten signature in cursive script, appearing to read "Jeff".

S 002122

August 19, 1997

Jeff,

It is the responsibility of the article editors at Physics Today to produce finished articles starting from any point in a given article's development.

Thus the responsibility of generating "ready to edit" articles is in part yours. For one example, we had agreed that you would obtain Colson's article on free-electron lasers, and have it edited in case we needed it for an emergency fifth article in the October special issue on the electron; otherwise we could drop it into the magazine a month or two later. Fortunately, we don't need it for the special issue; to my knowledge you have yet to acquire the article.

You were my first choice to edit several articles in late stages of development in the recent past, but turned them all down: Fink (March); Cohn (May; I edited that one, while you edited none that month); Jeanloz to edit with Soulen (August); a second article for October (you were reluctant to take Perl); Kasap for November.

As recently as two months ago, when you wanted to take paternity leave (which I OK'ed), you told me you didn't want any additional articles through the end of this year. As noted above, I offered you some anyway and you turned them down. You expressed no interest in articles, so I left you out of my plans for them.

I understand your special circumstances and once again offer you my heartfelt congratulations on the birth of Joshua Rose. If you are now ready once again to accept the responsibilities that go with feature articles, I can supply you with as many as you want. The articles that are currently "ready to edit" have been assigned to others. Nevertheless, I am sure we can reach a mutually acceptable state of affairs.

A handwritten signature in cursive script, appearing to read "Steve". The signature is written in dark ink on a white background.

S 002123

PHYSICS TODAY

from Stephen G. Benka

Jeff, As we discussed,
as of today we are shifting
your job tasks slightly:

Actual editing goes from a
weight of 80% to 70%.

Following up on solicited
articles goes from 15% to 25%.

—Steve
8/25/97

2 September 1997

Steve --

Thank you for responding to my note of 18 August 1997, in which I ask for more work -- specifically, more feature-article manuscripts that I can edit for publication in the magazine ahead of deadline. I was dismayed to find that instead of welcoming my request, your response focuses on assigning blame for the lack of such manuscripts and goes on to deny that we have any such deficiency.

You base the first part of your response on the fact that Physics Today staff members do follow-up work with the people whom you have invited to write articles for the magazine. You note that these staff members are therefore "in part" responsible for obtaining manuscripts that are ready to edit for publication. All this is true, but our severe shortage of such manuscripts is not due to deficient solicitation follow-up work by the staff as you imply. The article editors on the staff have, in fact, done a good job of following up on solicited articles -- staying in contact with the authors and working with them to produce the articles that you have asked them to write. If you think you could do better than we do, you should share your secret. For whatever it is worth, my experience is that when a conscientious and hardworking staff is blamed for a long-standing problem, the diagnosis is usually incorrect, and an incorrect diagnosis is an impediment to a real solution. (In my own case, according to my job description, solicitation follow-up has been a small part of my job; but I work at it conscientiously, and on my latest annual review you said that I do above-average work in this area.)

No, the problem is not your staff's lack of competence in its follow-up work with authors. The problem is simply that the magazine has solicited far too few articles. This has had unfortunate consequences, not only for the staff (as my note of 18 August 1997 describes for my case), but also for the magazine's subscribers. In the past three years I doubt that we have had even three months in which we have had a backlog of manuscripts ready to edit. Typically, the editor scrapes each issue together in a near-crisis atmosphere, after a desperate search around the office for manuscripts that may have arrived -- or that are said to be "in the mail." The lineup of articles in most issues of Physics Today is thus dictated by forces beyond our control.

Your listing of manuscripts that you say you offered to me begs the question of giving me more manuscripts that I can edit and prepare for publication, because we did not have the manuscripts on your list. In your own words, they were "in late stages of development." I should point out that even manuscripts that you consider ready to edit often are not. And when the shortage of manuscripts forces us to schedule incomplete manuscripts for near-term publication, we often have to pressure authors to work with us under undo

time pressure. This is unfair to both the author and the Physics Today staff, because it deprives them of the opportunity to do their best and therefore most satisfying work. The largest group to suffer, of course, are the readers. I don't know how many of the articles that you listed fell into that category, because I did not work on those articles.

As I said in my memo of 18 August 1997, I think article editing work is done most efficiently when it is done well ahead of the deadline. So in general I seek to work in advance and am reluctant to take on articles that, due to the shortage, will necessarily have to be done at the last minute, often after I have already scheduled work on other articles and often well after any reasonable deadline for submission. Month after month our work should not consist of "rush jobs" for issues that are upon us. I would have taken on the articles in your list if they had been scheduled for later issues -- or, even better, if they had not yet been scheduled for specific issues. But because of our serious lack of manuscripts, it has almost never been possible to work ahead.

In your response you say that I "agreed" to obtain William Colson's article by a particular date. This cannot be true. There is no way that I or any other Physics Today staff member could credibly "agree" that Colson and his coauthors would finish writing their article by a date that you picked arbitrarily. Only Colson and his coauthors -- all volunteers, remember -- could do that, and they did not. We cannot suddenly and unilaterally spring a short deadline on an author. The most we can do is ask our authors if they can meet such a deadline. Over the years you have asked many authors whether or not they could meet particular deadlines that you had in mind, and you have accepted later deadlines when they told you what they could do. Just because you are now talking to a staff member, rather than directly to the author, doesn't mean you can "just say article" and have it appear.

In the final paragraph of your response to my request for manuscripts, you boast: "I can supply you with as many as you want." This is simply not true. In fact, when we spoke after I received your response, you could not supply even one manuscript that I could edit for the January issue, the February issue or any subsequent issue. Of course, we will eventually come up with something to fill the holes in those issues. But, as usual, that is not likely to happen soon enough to allow us to work ahead. I am sure we could continue to pretend that this modus operandi is not a serious problem -- after all, we have managed to get by with it for a number of years. But it takes an unnecessary toll on many people, and so I think we have a moral responsibility to the staff (article editors, editorial assistants, art editor and copy editors), authors and

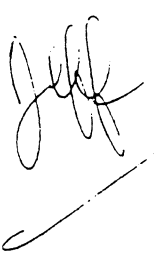
readers to solve the problem. I think the obvious first step is to admit that we do have a serious shortage of manuscripts and that the shortage leads to the problems that I have described here and in my note of 18 August 1997.

As I mentioned above, solicitation follow-up work has been only a small part of my job -- at least that is what I thought. When I saw how much you emphasized it in your response to my note, I took a look at my job description and noticed that such work was a bigger part of my job than I had remembered. Upon further investigation, however, I discovered that you had altered my job description after the fact to add truth to your claim. Indeed, the altered job description was dated 19 August 1997, the same date carried by your response to my note. For future reference, let me say here that I and other members of the staff prefer an above-board management style, where, for example, important changes are pointed out to people rather than being left for them to discover -- or, perhaps, not discover. In any case, you and I discussed the change in my job description on 25 August 1997, and I agreed to it. Thus, I will increase my solicitation follow-up work by about 2/3 and reduce my article editing by 1 part in 8. (I will continue to spend the large majority of my time on article editing.) Because of my preference for doing things above-board, I asked you to write me a note describing the change in my job description, and I thank you for doing so.

For the record: In your response to my note, you say that you OK'd my request for paternity leave. My recollection is that you neither approved it nor denied it, because I withdrew my request before you responded.

So that we don't wander too far from the original issue, let me repeat that I made my 18 August 1997 request because I felt that I was being held responsible for a particular amount of work (my annual article-editing goal) while being made to work so inefficiently that I could not do that amount of work -- at least not with sufficient time left over to take some time off. My revised job description will lessen slightly my need for ready-to-edit articles, and so should provide some relief in this area.

The Riordan manuscript has just arrived, and I would like to work on it now, so as to finish it as far ahead of the deadline as possible. Unless you tell me otherwise, that is what I will do. Perhaps I will take some vacation time later, depending in part on what other work comes in.



S 002127

From: "Martin L. Perl" <martin@SLAC.Stanford.EDU>
To: Jeff Schmidt <jds@aip.org>
Date: 2 Sep 1997 (Tue) 17:13
Subject: Leptons After 100 Years Article

Dear Jeff

Thank you for changing my ugly duckling of a manuscript into a beautiful swan. You have done a wonderful job.

I have the following comments:

Page 35, column 2: the ***** in "See box 1 on page ***** 36 has not been inserted yet.

Page 39, column 2: the ***** in "See box 2 on page ***** 40 has not been inserted yet.

Page 36, bottom equation in column 2: space required between virtual and Z0.

Page 38, Figure 4: TAU DETECTION scheme might be changed to TAU DETECTION apparatus.

Page 40, Box 2, column i: yes, each h should be an h-bar.

Page 40, References: the names in Ref. 3 are spelled correctly; in Ref. 10 the page number is 2074; in Ref 16 the page number is indeed 79c, it is a conference proceedings and every page has a c added to the page number.

Thank you so much Jeff for all your help and guidance. I am greatly looking forward to the issue.

Sincerely yours

Martin Perl

S 002128

From: "George Crabtree" <george_crabtree@qmgate.anl.gov>
To: "Judy Barker" <jbarker@aip.acp.org>
Date: 15 Apr 1997 (Tue) 19:24
Subject: Vortex Article

Subject:
Vortex Article

Time: 5:26 PM
Date: 4/15/97

Dear Steve, Jeff, Barbara, and Judy,
I just received the offprints for our article on Vortex Physics in the April issue of Physics Today. What fast service! The article looked very good in the magazine, and I got a warm feeling on finally seeing it in print. Thanks to all of you for your efficient and competent efforts to bring the article out. For David and me, it is gratifying to see the fruits of our work appear with such high production standards. Thank you all once again.
Sincerely,
George Crabtree

George Crabtree - MSD/223
Argonne National Laboratory
9700 S. Cass Avenue
Argonne, IL 60439

phone: 630-252-5509
fax: 630-252-7777
e-mail: crabtree@anl.gov

CC: "David Nelson" <nelson@cmt.harvard.edu>

S 002129

Letter to the Editor
Review Form

MS Number: L-9705-527-U
Author: Weinstock, Robert

Title: Comments on "Probing the Faintest Galaxies, April 1997

Review by: js Date Assigned: 5/22/97 Date Completed: _____

☒ Accept ☐ Reject ☒ Staff Revise ☐ Author Revise

I think a lot of our readers would appreciate an answer to the question that Weinstock raises. I suggest that we publish a shortened letter (see enclosed edited version) along with an answer from Ferguson.

-JS

Please return to Susan Funk by **5 June 1997**. Many Thanks!

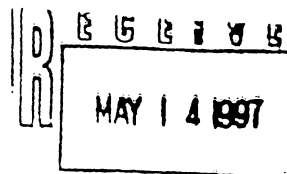
Review by : _____ Date Assigned: _____ Date Completed: _____

☐ Accept ☐ Reject ☐ Staff Revise ☐ Author Revise

OK. Get Ferguson's response.

-Steve 6/30/97

S 002130



ORIGINAL

PHYSICS TODAY

L-4705-527-U

Letter to Physics Today:

In "Probing the Faintest Galaxies", by Ferguson, Williams, and Cowie (April 1997), the caption to Figure 1 reads, in part, "For most of the galaxies in the image, we are looking back more than half the age of the universe".

25 This claim seems strange to me; for radiation emitted so long ago must have had its source so close to Earth at the moment of emission — according to the generally assumed big-bang origin of the currently expanding universe — that it would have reached Earth, if at all, well before the era of telescopes, spectrometers, and, of course, us. That this is so springs from the fact that no source can recede from the earth at a speed greater than that of the radiation — namely, c .

To derive this conclusion, let us measure all times and distances relative to Earth's rest frame and let

t = measure of time, from big bang at $t = 0$

T = age of universe (= time elapsed from big bang to Earth's receipt of radiation from source)

θ = time after big bang at which radiation is emitted from source

\bar{v} = average speed of separation of source and Earth from big bang ($t = 0$) to emission of radiation ($t = \theta$).

Thus the total separation of source and Earth at time of emission — i.e., the distance the radiation travels at speed c from source to Earth — must be $\bar{v}\theta$, and the time elapsed during the radiation's journey is

$$T - \theta = \frac{\bar{v}\theta}{c},$$

from which follows

$$\theta = \frac{T}{1 + (\bar{v}/c)}$$

And from $0 < (\bar{v}/c) < 1$, — i.e., the limiting feature of the speed of light — we conclude

$$0.5T < \theta < T.$$

Any radiation we receive today must have been emitted, ~~therefore~~ at least half the age of the universe after the big bang.

How, then, if the above analysis is sound, do Ferguson, Williams, and Cowie — along with others — suppose radiation to have reached Earth in the 20th century from a source that was, at moment of emission, farther from Earth than $(cT/2)$? Since they evidently infer emitter distance from the doppler-shift magnitude, a ready-to-mind answer is their use of an erroneous relation between emitter distance and doppler shift measurement.

If, ~~however~~ there is something wrong with my analysis ~~above~~, I shall be grateful to have it explained to me.

Robert Weinstock

Robert Weinstock

Emeritus Professor of Physics

Oberlin College

Oberlin, OH 44074

ZWEINSTOCK@OBERLIN.EDU

(216) 775-8337

Jeff: Spurred by your review, we are planning to publish Weinstock's letter [①]; Ferguson [②] suggests we read his response [③] and consider publishing neither. What think you?

From: Harry Ferguson <ferguson@stsci.edu>
To: ACP, AIP (pelliot)
Date: 7/28/97 10:37am
Subject: Reply to Weinstock letter

/Paul
28 July 97

Dear Paul,

Here is our reply to the letter to the editor. Actually, we wouldn't recommend publishing either the letter or our reply, as this sort of basic question about light travel times seems a bit out of place for your letters section. Perhaps you should forward our reply to Dr. Weinstock directly and see if that satisfies him?

Sincerely,
Harry Ferguson

SB: Weinstock letter below, followed by Ferguson reply. Ferguson recommends we not publish either. So does Chas. Jeff says otherwise - see next page. I suggest we ask Weinstock if the answer suffices for him; he may feel publication leaves his lack of understanding of cosmology. What say you?
Paul
8/13/97

① Weinstock Letter to the Editor

In *Probing the Faintest Galaxies,* by Henry Ferguson, Robert Williams and Lennox Cowie (PHYSICS TODAY, April, page 24), the figure 1 caption reads, in part, *For most of the galaxies in the image, we are looking back more than half the age of the universe.*

This claim seems strange to me. Radiation emitted so long ago must have had its source so close to Earth at the moment of emission*according to the generally assumed Big Bang origin of the currently expanding universe*that it would have reached Earth, if at all, well before the era of telescopes, spectrometers and, of course, us. That this is so springs from the fact that no source can recede from the earth at a speed greater than that of the radiation*namely, c. A simple calculation, in fact, shows that we are looking back through less than half the age of the universe. Can it be that Ferguson et al. are using an erroneous relation between emitter distance and doppler-shift measurement?

If there is something wrong with my analysis, I shall be grateful to have it explained to me.

> @SIGNATURE = ROBERT WEINSTOCK
> @ADDRESS = (zweinstock@oberlin.edu)
> @ADDRESS = Oberlin College
> @ADDRESS = Oberlin, Ohio
>

② Ferguson et al. reply

③ The redshift distribution of the galaxies in the HDF is not known precisely, however, a very conservative guess based on Keck spectroscopy of the brighter galaxies and the colors of the fainter galaxies is that more than half the galaxies have redshifts $z > 0.8$.

The statement made in the caption of figure 1 comes from a

calculation of lookback time to a galaxy at $z = 0.8$. For a critical-density universe with a cosmological constant $\lambda = 0$, the lookback time is

$$\tau = \frac{2}{3} H_0^{-1} (1 - 1/(1+z)^{3/2})$$

and the present age of the universe is

$$t_0 = \frac{2}{3} H_0^{-1}$$

where H_0 is the Hubble constant.

For this cosmology, a galaxy at $z = 0.8$ has $\tau = 0.6 * t_0$. In other words the lookback time is more than half the present age of the universe.

A general expression for the lookback time with arbitrary values of the cosmological constant and density parameter is given in Carroll et al., 1992, Ann. Rev. Astron. Astrophys., 30, 499 (equation 16).

Henry Ferguson
Robert Williams
Lennox Cowie

Paul —

Weinstock's question should get a physical explanation as an answer, not a mathematical one like this. — say drop the mathematical one, don't just add the physical one to it. Perhaps ask Ferguson & Co. to write what they would say to a high-school student ^(or radio audience) who noticed this seeming contradiction. One possible reason that Fergie & Co. answered as they did is that they don't really understand the physics.

— Jeff

28 Jul 97

S 002134

PHYSICS TODAY

from Stephen G. Benka

Paul,
Forward Ferguson's
response to Weinstein.
We won't publish
either the letter or the
response.

Steve 8/14/97

Scientocracy

Vannevar Bush envisioned a brave new world run by scientists.

ENDLESS FRONTIER

Vannevar Bush,
Engineer of the American Century.
By G. Pascal Zachary.
Illustrated. 518 pp. New York:
The Free Press. \$32.50.

By Thomas P. Hughes

DURING World War II, Vannevar Bush mobilized America's engineers and scientists, presided over the making of the atomic bombs, advised President Truman on the decision to use them against Japan and, in a memorable essay entitled "Science — The Endless Frontier," formulated a bold policy for the country's postwar cultivation of science and engineering. He defined, as well, the military-industrial-university complex and gave it the impetus that propels it today. As G. Pascal Zachary observes in "Endless Frontier," no wartime figure in the world marshaled such enormous engineering and scientific resources.

Born in 1890 in Everett, Mass., Bush cultivated his scientific interests while a mathematics student at Tufts and a graduate student in electrical engineering at M.I.T. In the 1920's, when American engineering was in transition from the improvisatory pragmatism of the past to the science-based approach of the future, Bush became known for blending traditional scientific values with the emerging professional ones. At ease in the machine shop as well as in the laboratory, he spoke of himself as using both the hand and the head.

M.I.T., which was in the vanguard of this professional transition, adopted Bush as an exemplary faculty member and later named him dean. He won worldwide peer recognition as the foremost designer of electromechanical analog computers. Decades later, his Atlantic Monthly article "As We May Think" spread the notion of mechanizing the storage and retrieval of information, an idea that fired the vision of several computer pioneers. Zachary, a business and technology reporter for The Wall Street Journal, has aptly subtitled his biography "Engineer of the American Century."

Bush assumed that men of brains, judgment and good will would rise to positions of responsibility in the engineering and scientific world. (He was not at all sure that this was true in political and military realms.) An elitist holding high academic standards, he believed that university engineers should reach out to render public service, not only solving problems assigned to them, but helping to formulate policy as well. This agenda would bring him into sharp conflict with the Washington establishment.

After World War II began in Europe, Bush, answering a call from Washington to mobilize engineers and scientists for national defense, put together the Office of Scientific Research and Development. Contemporaries called it the greatest research and development organization in history. Its story has often been told, but Zachary goes deeper to explore Bush's influential and often controversial views on the role of experts in a democracy, an issue that surfaced then and that remains only slightly below the surface now.

Bush and elitist science associates like James

Conant, the president of Harvard, sharply criticized the military for not developing strategy and tactics that incorporated new weapons, such as radar and the proximity fuze. Bristling with impatience, Bush used his direct access to Franklin D. Roosevelt, as well as his freedom from Congressional oversight and his huge budget, to bring pressure on generals and admirals to accept scientists and engineers as partners in making policy.

Turf battles were inevitable. The Chief of Naval Operations, Adm. Ernest J. King, a formidable opponent, accused Bush of "trying to mess into things in connection with the higher strategy which were not his business, and on which he could not have any sound opinions." Other officers scornfully dismissed the civilian experts as men without combat experience.

Bush's advocacy of unfettered scientific expertise brought criticism from the politicians as well. The United States budget director, Harold Smith, declared that Bush "is too much influenced by the assumption that researchers are as temperamental as a bunch of musicians, and consequently we must violate most of the tenets of democracy and good organization to adjust for their lack of emotional balance." "Most of them," he added, "do not know even the first thing about the basic philosophy of democracy."

Undaunted, Bush, according to one colleague, talked "straight to generals and cabinet officers and the President," and made them "take it." After fierce confrontations, he would sometimes withdraw in the evenings to Washington's exclusive Cosmos Club and negotiate with his opponents over a bottle of Scotch. He often prevailed.

Jerome Wiesner, John F. Kennedy's science adviser, thought that the 20th century might not again produce Bush's equal in engineering and science policy. Alfred Loomis, a knowledgeable science patron, investment banker and radar expert, concluded that among the men whose death in the summer of 1940 would have caused the greatest calamity for America, Roosevelt was first and Bush would be second or third.

BY war's end, however, Bush was bone-tired, broken in spirit and bereft of influence. Finding the Truman Administration's science policies suggestive of a chapter from "Alice in Wonderland," he left the Government in 1948. In his last great effort, he tried and failed to establish a National Research Foundation, a peacetime replacement for the research and development office, one that would cultivate fundamental science both for military and civilian uses. He wanted peacetime science unfettered by political controls, but failing to perceive a growing call for public accountability, he aroused overwhelming opposition. James V. Forrestal, the first Defense Secretary, observed that "even with both ears to the ground," Bush did "not hear the rumble of the distant drum."

Deeply informed and insightful, Zachary has thoroughly captured the spirit of Bush and his times. In evaluating the man's legacy, he honors Bush as a role model for his generation's engaged engineers. But Zachary is impatient with Bush for resisting people whom he considered government interventionists, intent upon pursuing science primarily for the ill-fed, poorly educated and underemployed. Zachary is surely right in concluding that Bush's single-minded support of elitist universities and his advocacy of the "free play of free intellects, working on subjects of their own choice" would find little support in Washington today. □

Thomas P. Hughes is a professor of the history of science and technology at the University of Pennsylvania and M.I.T.

The New York Times, 26 October 1997

Advocate of the Atomic Age

ENDLESS FRONTIER
Vannevar Bush, Engineer of the
American Century

By G. Pascal Zachary
 Free Press. 518 pp. \$32.50

By Gregg Herken

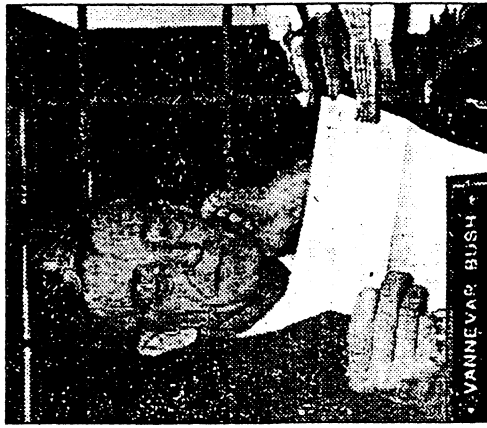
ALL that has been written about the making of the atomic bomb tends to ignore the fact that the Manhattan Project was primarily an engineering effort. Historians have lavished most of their attention upon the more temperamental—and hence colorful—physicists involved. Journalist G. Pas-

Gregg Herken, a historian at the Smithsonian, is writing a book about physicists Ernest Lawrence, Robert Oppenheimer and Edward Teller.

cal Zachary's *Endless Frontier*, the first biography of an engineer who was once the doyen of America's scientific establishment, takes a major step toward setting the record straight.

Vannevar Bush was a prototypical Boston Yankee whose father was a Universalist preacher and grandfather a sea cap-

tain. Bush's flinty persona and wry humor reflected those origins. (His "screwball" first name was borrowed from that of a family friend.) Educated at Tufts and MIT, Bush received a PhD in electrical engineering in 1916 and set about to broaden his horizons: "I resolved to learn about



Vannevar Bush in 1947

government-funded research to "supplement" rather than compete with work done by the military services. Predictably, however, the Pentagon viewed Bush's plan

as well as things."

An inveterate tinkerer, Bush invented before he was 40 a device to detect submarines, a code-breaking machine, a solar-powered pump, and the "differential analyzer"—an early, mechanical version of the computer. In the mid-1920s, he co-founded Raytheon and was made wealthy by the

"Bush's greatest invention was not a thing but an organization—the National Defense Research Committee."

subsequent growth of the electronics giant. In 1939, on the eve of World War II, he became president of the Carnegie Institution in Washington, D.C.

Yet Bush's greatest invention was not a thing but an organization—the National Defense Research Committee—which he

as a threat, and the cronies and pals who surrounded FDR's successor, Harry Truman, also feared—with some reason—that Bush's real goal was a technocracy, a government by experts. Blocked at every turn, Bush could do little but complain and wax nostalgic about the halcyon days of the war. He finally left the government in 1948.

Over time, Bush's hardheaded pragmatism became an ossified suspicion of the new. He was most famously wrong about ballistic missiles—"I think these things will be just too expensive and inaccurate to use, even if they could be built"—but his attachment to the analog technology of his differential analyzer likewise blinded him to the potential of digital computers, even though he was one of the first to herald the coming of the information age. (In one area, Bush's naysaying may only have been premature. He warned in 1960 that putting people in space was merely a "stunt" that would eventually "bore the public" and "kill some promising youngsters in the process.")

In retirement, Bush was saved from be-

and President Franklin Roosevelt created in time to mobilize the country's scientific brainpower for the coming conflict. The quality that Bush typified and that he valued most—the ability "to think straight in the midst of complexity"—was key to his and the NDRC's success in jump-starting the nascent atomic bomb project, which hidebound bureaucrats and flighty physicists had left dead in the water. When a National Academy of Sciences panel dithered as to whether a bomb was possible, Bush added a handful of engineers and sent them back to the drawing board; the panel decided the bomb was feasible after all.

Bush also had the talent to recognize his own limitations. "Most of this was over my head," he readily admitted to physicist colleagues who were probing the mysteries of fission. Accordingly, Bush teamed up with another Bostonian—chemist James Conant, presi-

coming simply a curmudgeon by two courageous acts that received little or no public attention. In 1952, while on a blue-ribbon panel studying the disarmament of America's hydrogen bomb until the possibility of a ban on such tests could be explored by Truman's successor. Two years later, Bush spoke out in Robert Oppenheimer's defense at the latter's security hearing, where the physicist was being pilloried for his opposition to the H-bomb. While for naught, Bush's heroic stand at the Oppenheimer hearing was arguably his finest hour.

In an era when science as well as history is said to be only a reflection of changing cultural values, Zachary's book gives a glimpse into a simpler time. Vannevar Bush was the exemplar of a generation that has now vanished. Bush evoked the attitudes and standards of that generation when he wrote, in December 1940, of standing "at the mouth of the cave with a few strong men of the clan armed with stone axes against a hostile world."

Arms and the Man

By ERICH EICHMAN

It is odd to think that a man whose face appeared on the cover of Time magazine in 1944, and whose death occasioned a front-page obituary in the New York Times 30 years later, should be all but forgotten today. But such is the fleeting fame of the



Bookshelf

"Endless Frontier"
By G. Pascal Zachary

technocrat. Vannevar Bush was much more than that, of course. He was a pioneering engineer and inventor, an entrepreneur, a visionary and a social philosopher whose "Modern Arms and Free Men" was a 1949 bestseller and whose hymn to science (and appeal for funding), "Science—The Endless Frontier," caused a sensation when it was released in July 1945.

But his glory years were spent in Washington heading up various technocratic entities (the Carnegie Institution, the Office of Scientific Research and Development), advising presidents, pulling strings on Capitol Hill, worrying over funding, and overseeing projects, most notably the secret one that produced the first atomic bomb.

In his way, Bush was a precursor of the "Wise Men," the elite insiders who guided U.S. policy in the postwar years. His influence reached its height under Roosevelt and faded precipitously thereafter, but his concerns—the relation of science to government and the military, its role in society—are still very much with us.

No doubt Bush would have welcomed our computer revolution, for he was essentially an optimist who saw technology as a force for good. Most important, during the crisis years of his greatest prestige and authority—when the country was at war or preparing for it—he argued (presciently, convincingly) that science had something essential to contribute to national defense, especially if civilian researchers were allowed to do their work unmolested by military bureaucracy.

Journal reporter G. Pascal Zachary has brought this able, conscientious, energetic and wrongly forgotten man to life in "Endless Frontier: Vannevar Bush, Engineer of the American Century" (Free Press, 518 pages, \$32.50). A few excerpts:

In the 1930s: "While innovation was clearly becoming corporatized, Bush still believed that the lone researcher often does produce out of thin air a striking new device or combination which is useful and which might be lost were it not for his keenness." Bush was himself just such an irrepressible inventor. While an astute manager of research teams, he often pursued his grandest intuitions alone. Rapid retrieval of personalized data, stereopho-

tography, typography, internal combustion engines and perpetual motion were just a few of his obsessions. For him, inventing was a calling, a way of life.

At the commanding heights: "Intensely self-assured, [Bush] deferred to no one, save Roosevelt and his mentor, Henry Stimson, the secretary of war. In the heat of war, his penchant for barging ahead worked wonders. The military gave more leeway to him than perhaps any other civilian in the war. Members of Congress granted his every request. 'Never once did we ask for funds and fail to secure them promptly,' Bush later boasted. Legislators rarely even questioned him, and when they did the exigencies of war made it possible for him to duck the tough queries anyway. He never flatly refused to satisfy a politician's curiosity, but rather dared him to comprehend the technical and military issues. Most politicians wisely kept their mouths shut."

The response to Bush's 1945 report: "Business Week called Science—The Endless Frontier 'an epoch-making report' that is 'must reading for American businessmen.' The Washington Post applauded Bush for delivering a 'thorough, careful plan for putting the needed push of the federal government behind our scientific progress.' . . . Only a handful of commentators questioned Bush's basic principle that research deserved broad public funding. The Wall Street Journal, for example, argued that tax incentives could achieve a similar result by inducing private industry to spend sufficiently on research."

After the war: "[Bush] shared with other elitists a stark and not altogether distorted view of American society that pitted sober, pragmatic elites against the untutored, volatile masses. For Bush, Truman and his cronies as well as most congressional leaders clearly fell into the 'masses' category. While Truman delighted in casting himself as an ordinary American, Bush—and other elite leaders—tended to view such citizens as irresponsible and sometimes irrational. The elite assumed that the mass of Americans needed patriarchal authority. In Bush's view, civilian technocrats were the solution to the inherent contradiction between the increasingly complicated problems facing government and the nation's democratic traditions. In practice, this meant that the public must pay for experts to make decisions in its name; these experts would brook little or no interference."

Looking back, in the 1950s: "He wondered whether men could 'live without war.' Now that 'the glamour of war is gone,' he asked whether the kind of direct combat 'that once had a real appeal for the red-blooded man' was obsolete. Others had noted that modern technology had made war impersonal and that the 'virile attributes' of war, which enlivened societies in the past, would have to arise from another source. But Bush's romantic yearning for an earlier stage of combat seemed peculiar given his role in exploiting the very technologies that further dehumanized war."

A vivid tale of an American science czar

By David Walsh
THE BOSTON GLOBE

Roosevelt called me into his office and said, 'What's going to happen to science after the war?' I said, 'It's going to fall flat on its face.' He said, 'What are we going to do about it?' And I told him, 'We better do something damn quick.'

Those are the words of Vannevar Bush, longtime professor at the Massachusetts Institute of Technology and America's science czar in World War II. They evoke the Washington manners of 1944, when those in positions of responsibility understood that they trod upon a historic stage and spoke such clipped sentences easily.

Bush had served as Roosevelt's science adviser since June 1940, overseeing the development of radar, the computer, the atomic bomb, antibiotics. When Roosevelt asked for a postwar plan, Bush delivered—again in a hurry.

In just four months, he responded with a famous report, "Science—The Endless Frontier," synthesizing the work of a series of bipartisan commissions. Though much battled over in the corridors of power, it nonetheless became the blueprint for the nexus between government, industry and academia that has lasted to the present day.

More than any other person, it was Bush who designed America's national system of innovation in the post-World War II era: the universities directing basic research, the federal government paying the bills and corporations concentrating on applied research, somewhere in between.

This was a good deal more fundamental than, say, thinking up the interstate highway system or inventing the television networks. It could be argued (leaving democracy aside) that it was the innovation system more than anything else that won the Cold War.

Bush is now the subject of a wonderful new biography by George Zachary, "Endless Frontier: Vannevar Bush, Engineer of the American Century." It traces his life from his boyhood in Amesbury, Mass., to his death in 1974. It is a story of a man who was as important as what he

Commentary

accomplished in the years between 1939, when he went to Washington, and 1954, when he left full-time government service and returned to MIT.

Yet even Bush's failure to adjust after those great days underscores the importance of the forces he had set in motion. And in Zachary's hands, the human forces behind the strange twists of technological developments are always available for inspection.

Named for his father's roommate at Tufts College, Bush went to Tufts himself. Afterward, with his Tufts roommate, Lawrence Marshall, he started a firm to make radio tubes that they called Raytheon. The firm was a success, but Bush went on to teach electrical engineering at MIT, where he pioneered in developing analog computers. Duty called in 1939.

By far the greatest part of Zachary's book concerns the war years. And here the stories are just too numerous to do more than list. The author's day job is as a reporter for The Wall Street Journal in San Francisco. He has a journalist's eye for color and knack for narrative; he has a historian's ear for deeper concerns.

So he weaves tales of the Manhattan Project with yarns of Bush's association with the Office of Strategic Services; stories of the FDR cabinet with anecdotes from scoundrel time. (One of his finest moments came when he went to bat for Robert Oppenheimer, whom he saw as victim of technological differences of opinion.)

It turns out to have been a far more complicated world than Bush had contemplated. Battles over federal funding of science are recounted. Bush favored winding down the military's role in funding science at the conclusion of the war; President Harry Truman overrode him in 1945. When the National Science Foundation finally was created five years later, Bush disclaimed the agency he had imagined. He feared that it was too little, too late.

After leaving government, Bush seemed to shrink in stature. The man who had marshaled forces on a equal footing

By the 1970s, U.S. industry found itself in a paradoxical situation: 'Awash in theoretical knowledge, it was starved for the basic processes and products that lead to victories in commercial contests,' according to a new biography of Vannevar Bush.

with Eisenhower, George Marshall and Chester Nimitz suddenly was a voice that found its fullest expression against the new: against guided missiles and satellites, against the race to the moon, against consumerism. He served to good effect on corporate boards, with the pharmaceutical company Merck in particular. His son founded Millipore Filter Co.; he himself raised turkeys in New Hampshire.

The world was far more bottom-up than the top-down world he favored, and, according to Zachary, this had deleterious effects on America's competitive position in the world economy. He writes: "The great defect of 'Science—The Endless Frontier' was its neglect of industrial innovation." Science was lionized as the source of all progress; invention and commercial engineering were lobbied off as subsidiary concerns. The result was that by the 1970s, U.S. industry found itself in a paradoxical situation: "Awash in theoretical knowledge, it was starved for the basic processes and products that lead to victories in commercial contests." (Oligopolistic market structure may have had something to do with it, too.)

Nobody knows better than Zachary how it was that, in key industries at least, American businesses fought their way back to positions of global supremacy. His first book, "Showstopper: The Breakneck Race to Create Windows NT and the Next Generation of Microsoft" (now undeservedly out of print), is a remarkable chronicle of the development of a major piece of software.

Its narrative hero is Dave Cutler, who was born in 1942, when Bush was at the height of his powers in Washington. Yet by

the end of the book, we understand that Cutler (once a top Digital Equipment executive) in his way has been just as effective in welding together a team hell-bent on a fixed objective as was any of Bush's minions in the war—with no higher authority behind Cutler than Bill Gates, the business strategist who built Microsoft on little more than his understanding of what it meant to be the standard.

Gates commands a research and development effort as extensive as any ever commanded by Bush. And the commercialization of research and development that began when international Business Machines moved into computing and American Telephone & Telegraph developed the transistor (and then stood by while Silicon Valley took its development to the next stage) has gone far beyond what he contemplated.

Which just goes to prove the point. Whatever its deficiencies as a plan of action, the outline first sketched in "Science—The Endless Frontier" have evolved into a pretty good map of the territory. The relationships between the regions are better understood. So are the possibilities for failed communication. The boundaries themselves seem a little more finite; the competition for resources a little more intense.

But veterans of a hundred cowboy movies know what happens next. Some guy comes through with a roll of barbed wire, or a motor car, or a machine gun, and it's off to the races again. The frontier is forever closing, at least as originally understood. And new vistas are opening all the time.

San Jose Mercury News, 31 August 1997



AUG. 31, 1997

VANNEVAR BUSH
AND THE POLITICS
OF SCIENCE

INSIDE

TAPPED OUT: Beer industry's love affair with marketing resulted in some flat sales. Page 4
AUDIO 'AMBUSH': Tom Wolfe's first fiction in a decade travels the recording route. Page 7

S 002140

A well-engineered life

■ Vannevar Bush devised policies that altered our lives

ENDLESS FRONTIER: Vannevar Bush, Engineer of the American Century
By G. Paschal Zachary
Free Press, 490 pp., \$32.50

BY PAUL PREUSS

A CHAMPION of scientific expertise in government, Vannevar Bush's name and face were all over the covers of *Time* and *Fortune* and *Newsweek* in the 1940s, but today — except for the mistaken impression that Bush foresaw the personal computer and the Internet — few remember him. *Wall Street Journal* reporter G. Paschal Zachary has performed a valuable service with this admirably detailed biography of a man who not only was the 20th century's leading American engineer, but who in a real sense engineered the American century.

How should history judge a man who described many of features of the PC in 1945 and inspired the pioneers of the personal computing movement, but who disparaged digital electronic computation? Bush built an enormous mechanical computer of brass and steel, known as a differential analyzer, as early as 1931. Although he helped found Raytheon in 1924 to manufacture better and cheaper electronic tubes for radios, he never lost his affection for analog computing machines. The memory in Bush's proposed desk-sized "memex" (never built) would have consisted not of magnetic tape or disks but of reels of microfilm.

How should we assess the vision of someone who headed NASA's predecessor organization, the National Advisory Committee for Aeronautics (one of his first acts was to establish a research center in Sunnyvale), but who thought rocketry was a waste of time and did his best to discourage the development of satellites, intercontinental ballistic missiles and moon rockets?

The middle years of the century, the years of World War II when Bush was at his acme, were a fulcrum for our national values, our self-image and our conception of ourselves as a distinctive people in the world. Like his times, Bush was a mass of questions and contradictions. He founded the Office of Scientific Research and Development (OSRD) and fought savage bureaucratic battles with Army and Navy brass to persuade them to invest in weapons



ASSOCIATED PRESS/WIDE WORLD — FROM *ENDLESS FRONTIER*
Vannevar Bush, shown here in 1942, was a high-profile engineer during World War II.

development. Because of Bush, American radar helped sweep U-boats from the sea, and the proximity fuze made anti-aircraft guns and artillery devastatingly effective.

At first Bush opposed nuclear research, thinking the prospects for a bomb "remote from a practical standpoint." He ended up launching the Army's Manhattan Project. What to think of a man who advised dropping the bomb on Japan, then wanted to share

nuclear secrets with the Soviet Union — and who staunchly opposed the development of the H-bomb?

He sounds almost liberal. Not at all. Bush was so conservative he distrusted democracy. Although he was one of Franklin Delano Roosevelt's greatest admirers and closest advisers, he thought the president should be relieved of his burdens by delegating power to a committee of technical experts. During the Communist witch

hunts after the war, Bush failed to defend the distinguished scientist E.U. Condon, under attack by the House Un-American Activities Committee, noting that "Communist infiltration constitutes a genuine menace in this country."

A Red baiter, then? Not that easy: He was one of Robert Oppenheimer's staunchest defenders at the 1954 AEC security hearings and a scathing critic of Joseph McCarthy. In 1967, Bush recalled, "Good Lord, I worked with Hoover, Truman, Eisenhower, Roosevelt, Kennedy, and I don't think any of them ever knew what my political philosophy was or were in any way interested in it."

Born in 1880 in Chelsea, Mass., the son of a Protestant minister, Bush began his inventing career while a student at Tufts College, where he earned a patent on a sort of analog computer mounted on a wheelbarrow, a surveying device. After graduate school at the Massachusetts Institute of Technology, he eventually became a professor there, and by 1932 he was MIT's vice-president. Washington, D.C., proved to be but a short step away.

Bush advocated civilian control over military research, but through the OSRD and other organizations he did more than anyone else to establish the military-industrial complex. After the war, his opposition almost sank the National Science Foundation and the civilian-controlled Atomic Energy Commission (today's Department of Energy) — and each had been his own brainchild! Bush was a masterful politician who could threaten and cajole and occasionally deceive to get what he wanted, but he had no constituency except scientists and engineers; having lost the support of younger scientists, his power quickly slipped away.

Virtually discarded by government leaders after World War II, Bush kept an office at MIT and died at home in 1974 at the age of 94. "In hindsight, how does one judge Vannevar Bush?" Zachary asks. "Right or wrong? Good or bad? Success or failure? Such questions certainly would strike Bush as absurd. ... His was a life not of looking back, but of charging ahead." Maybe a full reckoning of his importance isn't possible. Bush himself liked to say, "It is earlier than we think." ■

Paul Preuss' new novel is "Secret Passage," etc.



MIT — FROM *ENDLESS FRONTIER*
Vannevar Bush set up a laboratory in his home when he was a boy

S 002141

books

EE who swayed world

GER MORGAN

Ask most electrical engineers to list who did most to shape the second half of the 20th century, and you are likely to include one of their Vannevar Bush, professor of electrical engineering at the Massachusetts Institute of Technology (MIT), co-founder of Raytheon Corp., and civilian director of massive U.S. R&D effort during World War II. Yet the development of radar, the proximity fuse, active anti-submarine warfare, countless other innovations, and the decisive role in tipping the balance of the war to the Allies, and, in the longer run, in winning democracy as the pre-eminent form of government for industrialized states at the close of the century.

Bush was born in 1890 in a town just north of Boston, where his father was a Universalist minister, and he grew up in a nearby town, where the family moved in 1902. He was a strong-willed young man, a "spark of belligerency," who from early on to time endured bouts of illness. He showed great promise in mathematics and science, and perhaps just as importantly, proved adept at building things with his hands.

Biographer C. Pascal Zachary, a senior editor for the *Wall Street Journal*, explains it in "tinkering in his basement, Bush showed an activity with many brainy, middle-class boys around the country. The romance of invention...was contagious...and Bush realized that the path of the inventor offered him perhaps the only means of achieving conventional success without sacrificing his maverick leanings."

In 1909, when Bush graduated from Hulsea High, he was an independent-minded, politically conservative middle-class New Englander. He was "impatient with pomp," Zachary reports, an "outsider who resented the elite of society but hungered for recognition too." He went to Tufts University, in Boston, where he earned bachelor's and master's degrees in engineering. On one occasion, he read the textbook for a course in advance and asked the professor if he could cut classes to make some time available for other things, and just take the final exam when it occurred. The professor instead gave him the test on the spot—Bush passed and was granted credit.

After working briefly at General Electric Co., Bush entered a doctoral program at Clark University but then transferred to MIT, where he completed a thesis in the new electrical engineering department in less than a year. In 1916 he accepted a job at Tufts and, in parallel, took a position as laboratory director for American Radio and Research Corp. (Amrad). Three years later he moved to the electrical engineering department at MIT, where he expanded his program of research and industry consulting.

Bush's work at Amrad eventually con-

Endless Frontier:
Vannevar Bush,
Engineer of the
American Century.
Zachary, C. Pascal.
The Free Press, New York.
1997, 518 pp., \$32.50.



tributed to the establishment of a new company, Raytheon Corp., which grew rapidly, supplying vacuum tubes for the consumer radio market. Bush prospered along with it.

In 1932 Karl Compton, MIT's new president, made Bush vice president and dean of engineering. While the position gave him wide administrative responsibilities and greater exposure on the national scene, it did not end his research activities or consulting. Much of his research at MIT focused on analog mechanical computing machines (termed "differential calculators") and on "rapid selectors" for searching large physical files (such as banks of microfilm).

As the risk of war grew in the late 1930s, Bush became concerned with laying the R&D foundation for a conflict whose outcome, he believed, would be determined by technological prowess. He had already begun to expand his activities in Washington, D.C., when in early 1939 he was named to head the prestigious Carnegie Institution of Washington, a position that provided the springboard that soon vaulted him to the pinnacle of power.

Bush's appointment in 1940 to chair the National Defense Research Committee (NDRC), which was later transformed into the powerful Office of Scientific Research and Development (OSRD), resulted from vision, good ideas advanced

books

at just the right moment, the right friends, and superb salesmanship combined with technical accomplishment and great administrative skill. Bush built an organization that, while coordinating with the uniformed military services, defined its own research priorities and ran its own show with minimal oversight by the President and Congress.

Bush pioneered new contracting methods that mobilized the nation's top scientists and engineers, with minimal red tape, to address key problems, often in their own laboratories. By 1944 OSRD was spending \$3 million a week on 6000 researchers at more than 300 industrial and university labs. This count does not include the building of the atomic bomb by the Manhattan Project, over which Bush had responsibility through different administrative arrangements.

Readers unfamiliar with the critical role played by Bush and the OSRD in the war effort will find the central 150 pages of Zachary's biography an exciting and invaluable introduction. Details of Bush's skillful wooing and bullying of military leaders such as Admiral Ernest J. King are particularly interesting. I would have preferred a few more technical details, but except for confusion between the capabilities of the German V1 and V2 weapons, those provided are accurate.

Accustomed to wielding great power with remarkably little accountability, in the post-war era Bush found it difficult to adjust to the reemergence of politics-as-usual and bureaucratic regulation. He strongly supported the atomic bomb he had helped create, but he also recognized that the bomb had changed the world, and worked hard, if without much success, to put in place an international regime to manage this threat to security. On the other hand, he was slow to recognize the great strategic importance of ballistic missiles and the military uses of space. This blind spot worked to erode his standing with post-war military leaders.

Bush is widely credited with being the father of the social contract that guided post-war R&D in the United States. He was the principal author of the report, "Science: The Endless Frontier," which today is perhaps the most venerated, if rarely read, icon in Federal science and technology policy circles. Zachary's account makes it clear that while many of the ideas that led to the post-war system of Federal R&D originated with Bush, and with OSRD contracting experience, Bush by no means deserves all the credit. Indeed, his strong will, plus his failure to understand the changing political landscape, did much to delay the creation of the National Science Foundation.

In Zachary's account, Bush is an immensely impressive man to whom the country and the Western world owe a great debt of gratitude. He was also human, with an ego, a strong and sometimes abrasive style, and other failings and limitations. These are recounted with an honesty that in no way detracts from Bush's great achievements as an engineer, as an entrepreneur, and as an excellent R&D administrator.

Most of the "big names" in U.S. science and technology policy have started out in science, especially physics. But this fascinating and well-written biography is a reminder that one of the greatest of them all, and perhaps the most influential, was an electrical engineer.

Granger Morgan is the Lord Chair Professor of Engineering at Carnegie Mellon University, Pittsburgh, where he also is head of the department of engineering and public policy and a member of the faculty in electrical and computer engineering.

15 November 1996

Proposals for discussion at Physics Today retreat

The following proposed agenda items are in the spirit of Steve's invitation to put our concerns "on the table." This list was put together by some of the staff, based on discussions among staff members. The theme of these proposals derives from the main points raised by the Physics Today advisory committee: openness, staff empowerment and editorial efficiency. The proposals address issues that are very important to at least some of the staff, and they are intended to provide a basis for discussion. Each proposal is subject to adoption, modification or rejection during the retreat. PLEASE ADD TO THE LIST.

1. Agreement that we want to keep all the present staff members.
 - Security is a prerequisite for speaking freely, sharing ideas and experimentation.
2. Openness.
 - Recognize that all staff members are legitimately concerned about all aspects of the magazine -- both content and process.
 - Proposed changes in magazine's content or process should be announced to the staff and discussed.
 - Make letters to the editor available to all staff.
3. Volunteer reporters -- a staff-based information system.
 - Reporter gathers and disseminates information on progress toward agreed-upon goals. Not intended to replace management's information system. (Example: reporting on progress toward hiring someone to categorize books.)
4. Problem resolution: Editorial and other.
 - Editorial judgment: Burden of proof on critic.
 - In disputes, staff members are encouraged to consult others on staff.

S 002143

5. Distribute work according to staff interest.
 - Adjust job descriptions of yet-to-be-hired editorial and secretarial staff members based on current staff interests.
6. Physics Today management should act in a way that leads staff to see them as their advocates rather than as the local representatives of higher management.
 - Advocates in editorial controversies.
 - Advocates in annual reviews.
7. Voluntary staff participation in hiring.
 - Participate in writing job advertisements.
 - Examine resumes.
 - Talk to candidates.
 - Offer recommendations.
8. Take affirmative action to increase diversity of Physics Today staff.
9. Allow staff to solicit outlines for articles.
10. No need for detailed schedules.

(Distribution: All PT staff and managers.)

5 November 1997

Marc,

Thank you for asking me to meet with you today about my statement to the Physics Today advisory committee that the magazine has failed to live up fully to its claim that it is an affirmative-action employer.

I am taking this opportunity to outline the history of the issue at the magazine and to discuss the important difference between equal opportunity and affirmative action.

At a November 1996 Physics Today meeting, some of us on the staff raised the issue of affirmative action and the lack of diversity at the magazine. Several weeks earlier, one of the Physics Today editors had submitted his resignation, thus presenting us with an immediate opportunity to work toward correcting the problem. At the meeting, I said I would help monitor the situation in the future, as did Jean Kumagai, who is the only minority among the 18 individuals who work at Physics Today.

On 14 April 1997 the Physics Today staff learned that out of the 85 applicants for the editorial opening at the magazine, three had been selected to come in for interviews -- all white males. Among the 85 applicants were a number of potentially qualified minorities and women. Jean and I argued that if Physics Today were truly committed to affirmative action, it would also bring in some of these applicants. That could have been done easily, but Charles Harris and Steve Benka refused, saying that it was not worth the delay of a week or so that it would cause. We felt that this revealed Physics Today's priorities (and AIP's, too, because Charles had told us that he had discussed the institute's affirmative action policy with Terri Braun after the November 1996 staff meeting), and that affirmative action clearly was low on the list.

The decisive factor turned out to be that while Charles believes in equal opportunity, he does not believe fully in affirmative action. He told me, for example, that he would not hire a minority who is qualified to do the job unless that individual was more qualified than all 84 of the other candidates. Such a policy can lead to an all-white staff even though many minorities are qualified to do the work. For reasons outside of our immediate control, qualified minorities are less likely to have credentials beyond those needed to do the work. Thus, the qualified minorities are passed over in favor of white applicants who have such superfluous credentials. The result is a staff that doesn't look like the population of people who are qualified to do the work. Thus the Physics Today staff does not look like the physics community, the journalism community, the Washington community or the nation as a whole. As long as Physics Today fails to embrace affirmative action, minorities will continue to be in the subset of applicants

S 002145

deemed qualified to do the job, but rarely among those actually hired. Thus "equal opportunity" amounts to a de facto "whites only" hiring policy at Physics Today. Historically, affirmative action was instituted to overcome this shortcoming of equal opportunity.

Charles also told me that staff diversity is of no value to the magazine -- except to make the office a more interesting place to work. Therefore the fact that a particular job candidate would contribute to the diversity of the staff counts for nothing, he said.

My own concern about affirmative action at Physics Today was heightened when AIP and the magazine relocated from New York City to College Park four years ago. To fill the editorial openings created by the move, the magazine hired three individuals, all white males -- Ray Ladbury, Denis Cioffi and Steve Benka. None of the three had any journalism experience, but the magazine was willing to train them. (One could view this as an affirmative action program for white males.) If the magazine is willing to hire and train potentially qualified whites, then why not do that for minorities, too?

The managers at Physics Today made two token gestures in response to the pressure that we applied: They told a few organizations of minority scientists about the job opening, and, after they filled the position with a white male, they phoned a few of the minorities whom they had judged to be "promising candidates."

Ever since my disagreement with Charles over affirmative action at Physics Today, he has treated me a little bit like an unwelcome troublemaker. You should be able to verify any point that I have made in this note without attributing it; by doing it that way, you can avoid exacerbating this problem.



One Physics Ellipse
College Park, MD 20740-3843

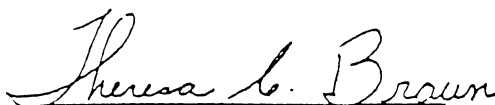
Tel. 301-209-3100
Fax 301-209-0843

1996 AFFIRMATIVE ACTION PROGRAM

FOR

AMERICAN INSTITUTE OF PHYSICS

Program completed by:

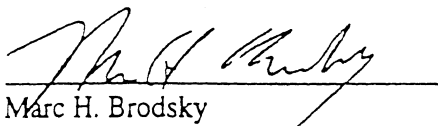


Theresa Braun
Director of Human Resources and
EEO Coordinator

Address:

One Physics Ellipse
College Park, MD 20740-3843

Program approved by:



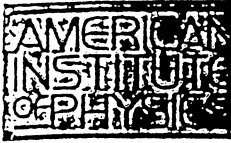
Marc H. Brodsky
Executive Director/CEO

This Affirmative Action Program is effective from January 1, 1996 to December 31, 1996.

Member Societies:

The American Physical Society
Optical Society of America
Acoustical Society of America
The Society of Rheology
American Association of
Physics Teachers
American Crystallographic
Association
American Astronomical Society
American Association of
Physicists in Medicine
American Vacuum Society
American Geophysical Union

S 002147



INTER - OFFICE MEMORANDUM

July 11, 1996

TO: Theresa C. Braun
FROM: Melinda Underwood *MU*
SUBJECT: Affirmative Action--1995

Below are the area in which AIP had underutilization in 1995:

Senior Managers	Female and Minority Underutilization
Senior Professionals	Female Underutilization
Other Professionals	Minority Underutilization

Let me know if you want to develop a narrative discussion of goals for the Affirmative Action Plan for 1996-1997.

S 002148

The American Institute of Physics--Discussion of Goals (1995)

After analyzing our Affirmative Action plan and looking at the utilization analysis, it has come to the attention of the American Institute of Physics (AIP) that underutilization of minorities and females exist in the following job group:

Senior Managers (101) Female and Minority

Sr. Professionals (201) Female

Other Professionals (202) Minority

The American Institute of Physics has been and will continue to be an equal opportunity employer. Our goals for increasing utilization of the above groups will include:

- ▶ Broadening the scope of our recruiting efforts. This will include expanding our recruiting outlets and resources such as utilizing the Internet, Department of Labor, and community resources for job postings.
- ▶ Exploring diversity training and continue to monitor hiring process. AIP is looking into offering diversity training for hiring managers and supervisors.
- ▶ Examining and identifying internal candidates for open positions and career development. This will include continuing cross job training, development of skills, and promotion of existing tuition reimbursement program.

RESPONSIBILITY FOR IMPLEMENTATIONA. Executive Management Responsibility

As the representative of executive management, the EEO Coordinator has primary responsibility and accountability for implementing, directing and monitoring this Affirmative Action Plan.

1. Implementing the affirmative action programs set forth in this Plan, including the development of policy statements and related internal and external communication procedures to disseminate those policy statements.
2. Developing and supervising the presentation of our equal employment opportunity policy during the supervisory training and new employee orientation programs, which may include question-and-answer sessions for supervisors and employees answering their questions about this Affirmative Action Plan.
3. Designing and implementing an audit and reporting system that will accomplish the following:
 - (i) Measure the effectiveness of our affirmative action programs.
 - (ii) Indicate when remedial action is needed.
 - (iii) Determine the degree to which our goals and objectives have been attained.
4. Advising management and supervisory personnel on developments in the laws and regulations governing equal employment opportunity.
5. Serving as liaison between the Company and all enforcement agencies.
6. Identifying problem areas and establishing goals and objectives to remedy underutilization in major job groups, if any underutilization exists.
7. Conferring with community organizations representing women, minorities, veterans, the disabled and older workers.

8. Auditing periodically our on-the-job training, hiring and promotion patterns to remove impediments to attainment of the Company's goals and objectives.
9. Rating supervisory employees based, in part, upon their efforts and success in furthering the goal of equal employment opportunity, and informing supervisory employees of this evaluation practice.
10. Discussing periodically the Company's commitment to equal employment opportunity with managers, supervisors, and employees. During these discussions, the EEO Coordinator will stress the importance of affirmative action, as well as nondiscrimination.
11. Reviewing the qualifications of all employees to insure that minorities and women are given full opportunities for transfers, promotions and training.
12. Providing access to career counseling for all employees.
13. Conducting periodic audits to ensure that the Company is in compliance with federal and state laws and regulations requiring:
 - (i) Proper display of posters explaining the Company's obligation to engage in nondiscriminatory employment practices.
 - (ii) Integration of all facilities which we maintain for the use and benefit of our employees.
 - (iii) Maintenance of comparable facilities, including locker rooms and rest rooms, for employees of both sexes.
 - (iv) Providing full opportunity for advancement and encouraging minority and female employees to participate in educational, training, recreational and social activities sponsored by the Company.
14. Counseling supervisors and managers to take actions necessary to prevent harassment of employees placed through affirmative action efforts and to eliminate the cause of such complaints. Further, the EEO Coordinator will

counsel supervisors and managers not to tolerate discriminatory treatment of any employee by another employee or supervisor and to report all complaints or incidents to him.

43

15. Establishing an internal complaint system that will enable employees to discuss complaints with the EEO Coordinator whenever they feel that they are being discriminated against on the basis of race, color, religion, sex, national origin, disability or veterans' status.
16. Serving as liaison between the Company and community organizations representing minorities, women, veterans, the disabled and older workers.
17. Developing expertise and knowledge of equal employment opportunity guidelines and regulations in order to advise and update top management and supervisory personnel concerning developments affecting our equal employment opportunity program.

B. The Responsibilities of Supervisors and Managers

All supervisors and managers must share in the day to day responsibility for implementing the affirmative action programs set forth in this plan. Specifically, they must endeavor to:

1. Respond to inquiries about our Affirmative Action and Equal Employment Policy, after consulting with our EEO Coordinator.
2. Assist our EEO Coordinator during the investigation of allegations of discrimination.
3. Participate in recruitment and accommodation efforts designed to enable disabled individuals, disabled veterans and others to secure employment and to advance to positions for which they are qualified.
4. Ensure that all federal and state posters explaining the laws prohibiting discrimination are properly displayed.
5. Participate in the development and implementation of affirmative action programs.

DISSEMINATION OF EQUAL EMPLOYMENT POLICY

I. Internal Dissemination

The Company will take the following actions to disseminate its Affirmative Action and Equal Employment Policy, as appropriate, on a regular and continuing basis.

A. Including the Affirmative Action and Equal Employment Opportunity Policy statement in its policy manual and employee handbook, as published. A copy of our EEO Policy, which is contained in our Employee Handbook, is attached at the end of this section.

B. Meeting with supervisory personnel to explain the intent of the Affirmative Action and Equal Employment Policy and their individual responsibilities for its implementation. We conducted supervisory training for all management about equal employment opportunity, affirmative action and sexual harassment during Plan Year 1995 and have continued the training into Plan Year 1996. We have attached information relating to our supervisory training at the end of this section.

C. Scheduling special meetings with employees or using Company newsletters to discuss and explain individual employee responsibilities or opportunities under the affirmation action program. During the current plan year we will be conducting

training for all employees about our affirmative action program and equal employment opportunity in the workplace.

D. Discussing our equal employment policy during any orientation programs we hold, at which time all new employees (and if applicable, transferred and promoted employees) will be advised of our commitment to affirmative action and equal employment opportunity. Our Affirmative Action and Equal Employment Opportunity Policy statement and policy statements affirmatively supporting the employment of minorities, veterans, the disabled and women will be explained during these sessions. During these orientation sessions a management representative from various areas of the Company, including Human Resources, explains the function of their department. Our Affirmative Action and Equal Employment Opportunity Policy statement and policy statements affirmatively supporting the employment of minorities, veterans, the disabled and women are explained during these sessions. We have attached at the end of this section an "Overview of New Employee Orientation Process", which includes a copy of our "New Employee Checklist," and addresses equal employment opportunity and affirmative action in the workplace.

E. Posting the Affirmative Action and Equal Employment Policy, along with all required State and federal informational posters, on our bulletin boards, and updating such posters as required. Our "Affirmative Action and Equal Employment Opportunity Policy Statement", "Invitation to Vietnam Era and

IDENTIFICATION OF PROBLEM AREAS (DEFICIENCIES)
BY ORGANIZATIONAL UNIT AND BY JOB GROUP

I. UNDERUTILIZATION

The EEO Coordinator conducted a Utilization Analysis for the 1996 Plan Year in which she compared the workforce representation of minorities and females to their statistical availability by job group. The Utilization Analysis led the Company to identify the following areas of underutilization:

Females are statistically underutilized in job groups 101 (Senior Managers) and 201 (Senior Professionals).

Minorities are statistically underutilized in Job Group 202 (Other Professionals Technicians).

The Company is addressing these potential problem areas by establishing goals which we will attempt to achieve through specific action oriented programs, which are described in the section of this plan entitled "Action Oriented Programs." Our Utilization Analysis and Goals are contained behind the tabs, so named, in this affirmative action plan.

II. ADVERSE IMPACT

To determine if our selection procedures have an adverse impact upon minorities and females during the first six months of our 1996 Plan Year, we conducted an adverse impact analysis upon our selection decisions. We compared the selection ratios of minorities and females to those of non-minorities and males, respectively, in the areas of hiring, promotion and termination. Through this analysis we discovered no areas for this time period of statistically significant adverse impact.

As a result of our adverse impact analysis, we examined each of the selection decisions that occurred in job groups where adverse impact was discovered as described in the Action Oriented Programs section of our plan. Furthermore, a full impact ratio analysis of our selection decisions and a narrative discussion of the legitimate business reasons supporting our decisions is found behind the "Jaar Analysis, Impact Ratio Analysis and Placement Analysis" tab.

III. IN GENERAL

In addition to the above, the EEO Coordinator will, on an annual basis, as applicable, identify potential problem areas in the total employment process, which may include review of the following areas:

- A. Composition of the workforce by minority group status and sex.

- B. Composition of applicant flow by minority group status and sex.
- C. Overall employee selection process including position specifications, application forms, interviewing procedures, test administration, test validity, referral procedures, final selection process, and other employee selection procedures.
- D. New hires, promotions, terminations, etc.
- E. Utilization of training, recreation and social events and other programs that are sponsored by the Company.
- F. Technical phases of compliance with laws prohibiting discrimination in employment and promoting affirmative action programs, e.g., retention of applications, notifications to subcontractors, etc.
- G. "Underutilization" of minorities or women in specific job groups.
- H. Lateral or vertical movement of minority or female employees occurring at a lesser rate than that of non-minority or male employees.
- I. The selection process eliminating a significantly higher percentage of minorities or women than non-minorities or men.
- J. Application and other preemployment evaluation forms or procedures not in compliance with federal or state law.
- K. Position descriptions inaccurate in relation to actual functions and duties of that particular job.
- L. De facto segregation, by race or sex, existing in job titles or job groups.
- M. Seniority provisions contributing to overt or inadvertent discrimination by minority group status or sex.
- N. Non-support of our affirmative action and equal employment programs and policies by managers, supervisors or employees.
- O. Minorities or women significantly underrepresented in training or career improvement programs.
- P. Lack of formal techniques for evaluating effectiveness of the programs set forth in this Plan.

From: Susan Funk
 To: SBENKA, JBARKER, GCOLLINS, PELLIOT, TFEDER, CHARRI...
 Date: 18 Sep 1997 (Thu) 13:29
 Subject: Additional Agenda items...

I have been asked to e-mail this to all of you.

-- Susan

Here are some critical topics we would like to see on the agenda for next week's Content Retreat.

(1) Revised editorial structure: implementation of the long-deferred editorial board to increase staff's participation in editorial function and decision making.

While some may regard this as "process" and not a valid part of this "content" retreat, this step is essential for any meaningful changes in content to be successfully implemented. PT has a highly talented staff that is frustrated by the current structure, which prevents the staff from making a significant and ongoing contribution to enhancing the magazine's quality. Implementing the editorial board is the best way to make the magazine's content more timely, lively, and interdisciplinary.

All the editorial staff should be part of the editorial board.

(2) Revised outlook: an outlook that is more independent, more daring, more thought-provoking, more representative of diverse views in the physics community, more appealing to younger readers, more responsive overall not just to our current readers but to the additional readers we would like to have, more competitive.

(3) Added functions: to provide a forum for debate, to discuss openly issues relevant to the physics community (including controversial or contentious ones), to underscore the social context and relevance of physics.

(4) Added department: creation of "reader viewpoint" feature in which PT publishes reader responses to questions formulated by the staff.

How this would work: In one issue we publish the topic on which we want readers to give their opinions. In a later issue, we publish a representative sampling of those opinions. Such a feature would create a lot of reader interest and could play a valuable role in the society of physicists. Our topics and the subsequent opinions could become the talk of physics coffee rooms and pre-colloquium gatherings.

(5) Revised departments: discontinue reporting of awards and job changes.

The undersigned believe that it is essential that these topics be discussed at the content retreat.

Judy Barker, Graham P. Collins, Chas Day, Paul Elliott, Toni Feder, Jean Kumagai, Elliot Plotkin, Jeff Schmidt.

16 March 1998

Dear Graham,

At the Physics Today staff meeting on 3 March, the editor announced your upcoming departure and called it simply "the big news." We found that characterization offensively neutral. The resignation of a dedicated, long-time staff member is not just "news"; it is a huge loss for both the staff and the readers of the magazine, and it is a failure on the part of the magazine. We are extremely sorry you are leaving Physics Today.

The fact that those in charge are not encouraging you to reconsider is consistent with their behavior toward you over the months, and it leads us to believe that they are not 100% unhappy about your resignation. We think they are fully aware and appreciative of your extraordinary dedication and hard work. But we think they nevertheless have mixed feelings about your presence on the Physics Today staff because you have been an outspoken voice for change at the magazine. We share your frustration over management's continued resistance to badly needed improvements, and so we find your decision to resign quite understandable. Nevertheless, we are sorry to lose you.

Of course, driving away people who point out problems will make for a seemingly smoother operation. But such maintenance of appearances comes at a very high price, because problems that are not clearly exposed cannot be adequately addressed or corrected. We have all seen this in the grossly mismanaged effort to prepare the 50th anniversary issue of the magazine. After each of the many meetings that we have had on this special issue -- meetings at which staff suggestions have been routinely ignored and important decisions routinely deferred -- staff members have whispered to each other privately, in the strongest possible terms, about the absurd amount of time and money being wasted. Nearly everyone agrees that the effort is being grossly mismanaged, but because no one has felt safe enough to bring the matter out into the open at a meeting, there has been no real discussion of how the effort could be better organized and executed. And so after all this time the managers have done nothing to improve the way it is being managed.

During the past year, Physics Today management has moved toward a more repressive work environment and toward a love-it-or-leave-it policy. As you know all too well, there is now much less pretense that "improve it" is a realistic option. Management has become suspicious of anything that could lead to change, and they act against it no matter what the cost to morale or to the readers and the physics community. Take, for example, Steve Benka's recent order forbidding private conversations between staff members at work and declaring that all conversations between staff members must be open to management supervision. Although

Charles Harris later told someone on the staff that this totalitarian measure would not be enforced, it has not been officially retracted, and so the chill remains.

Almost four months ago the Physics Today advisory committee warned that "PT could experience severe losses in its editorial staff if morale issues are not being addressed or are being addressed in a cursory manner. This issue needs continued and heightened attention from management." Physics Today management chose to ignore this warning, and now with your departure we are suffering the predicted consequence. (The magazine's loss of Susan Funk, who quietly cleaned out her desk on Friday 6 March and never came back, was also the result of frustration, we think, with the impediments to fashioning her editorial assistant position into something more than a dead-end job.)

Those in charge should not forget that Physics Today is a trust of the physics community. To needlessly lose dedicated and experienced staff members, especially those who make the extra effort to improve the magazine and the workplace, is to squander the physics community's valuable resources.

We hope some way will be found to keep you at Physics Today, although we realize that this is unlikely to happen. We have been fortunate to have you as a colleague, and we gained much from your honesty and insight. We hope you keep up the spirit in whatever you do.

S 002159

Memo to American Institute of Physics Executive Director and CEO
Marc H. Brodsky. I included a copy of this memo in my 27 April 1998
5 November 1997 communication with the Physics Today staff.

Marc,

Thank you for asking me to meet with you today about my statement to the Physics Today advisory committee that the magazine has failed to live up fully to its claim that it is an affirmative-action employer.

I am taking this opportunity to outline the history of the issue at the magazine and to discuss the important difference between equal opportunity and affirmative action.

At a November 1996 Physics Today meeting, some of us on the staff raised the issue of affirmative action and the lack of diversity at the magazine. Several weeks earlier, one of the Physics Today editors had submitted his resignation, thus presenting us with an immediate opportunity to work toward correcting the problem. At the meeting, I said I would help monitor the situation in the future, as did Jean Kumagai, who is the only minority among the 18 individuals who work at Physics Today.

On 14 April 1997 the Physics Today staff learned that out of the 85 applicants for the editorial opening at the magazine, three had been selected to come in for interviews -- all white males. Among the 85 applicants were a number of potentially qualified minorities and women. Jean and I argued that if Physics Today were truly committed to affirmative action, it would also bring in some of these applicants. That could have been done easily, but Charles Harris and Steve Benka refused, saying that it was not worth the delay of a week or so that it would cause. We felt that this revealed Physics Today's priorities (and AIP's, too, because Charles had told us that he had discussed the institute's affirmative action policy with Terri Braun after the November 1996 staff meeting), and that affirmative action clearly was low on the list.

The decisive factor turned out to be that while Charles believes in equal opportunity, he does not believe fully in affirmative action. He told me, for example, that he would not hire a minority who is qualified to do the job unless that individual was more qualified than all 84 of the other candidates. Such a policy can lead to an all-white staff even though many minorities are qualified to do the work. For reasons outside of our immediate control, qualified minorities are less likely to have credentials beyond those needed to do the work. Thus, the qualified minorities are passed over in favor of white applicants who have such superfluous credentials. The result is a staff that doesn't look like the population of people who are qualified to do the work. Thus the Physics Today staff does not look like the physics community, the journalism community, the Washington community or the nation as a whole. As long as Physics Today fails to embrace affirmative action, minorities will continue to be in the subset of applicants

deemed qualified to do the job, but rarely among those actually hired. Thus "equal opportunity" amounts to a de facto "whites only" hiring policy at Physics Today. Historically, affirmative action was instituted to overcome this shortcoming of equal opportunity.

Charles also told me that staff diversity is of no value to the magazine -- except to make the office a more interesting place to work. Therefore the fact that a particular job candidate would contribute to the diversity of the staff counts for nothing, he said.

My own concern about affirmative action at Physics Today was heightened when AIP and the magazine relocated from New York City to College Park four years ago. To fill the editorial openings created by the move, the magazine hired three individuals, all white males -- Ray Ladbury, Denis Cioffi and Steve Benka. None of the three had any journalism experience, but the magazine was willing to train them. (One could view this as an affirmative action program for white males.) If the magazine is willing to hire and train potentially qualified whites, then why not do that for minorities, too?

The managers at Physics Today made two token gestures in response to the pressure that we applied: They told a few organizations of minority scientists about the job opening, and, after they filled the position with a white male, they phoned a few of the minorities whom they had judged to be "promising candidates."

Ever since my disagreement with Charles over affirmative action at Physics Today, he has treated me a little bit like an unwelcome troublemaker. You should be able to verify any point that I have made in this note without attributing it; by doing it that way, you can avoid exacerbating this problem.



A handwritten signature, likely "Jeff", in cursive script. Below the signature is a long, thin diagonal line extending from the left towards the center of the page.

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Myriam P. Sarachik
President, American Physical Society
Department of Physics, CCNY-CUNY
Convent Avenue and 138th Street
New York, NY 10031

17 March 2003

Dear Myriam Sarachik,

After a long investigation — the most detailed to date by scientists — an IEEE human rights committee has issued a disturbing report on the dismissal of physicist Jeff Schmidt by the American Institute of Physics. As you know, Jeff was fired after 19 years at *Physics Today* magazine, upon publication of his book, *Disciplined Minds*.

The IEEE committee joins a long list of individuals and organizations that have publicly condemned AIP's action as suppression of dissent within the physics community. Among the 800 scientists and other scholars who have gone on record against AIP's repressive behavior are more than 500 physicists, mostly APS members — the largest number of physicists ever to speak out on a freedom-of-expression issue in the United States.

In one of the scores of protest letters, APS member Al McInturff notes that if we fail to take a stand against suppression of dissent, then "by our silence we concur." This is especially true when the repression is carried out in our name, as it was in this case, because the American Physical Society is the leading organization that governs the American Institute of Physics. APS cannot say, "We aren't responsible for AIP's behavior."

The 500 APS members who are objecting to Jeff's firing would, of course, like their Council to be responsive to their concerns. On their behalf, we ask you to raise the issue formally with the APS Council, of which you are a member. Specifically, we request that the Council hold an on-the-record discussion of the issue and take the following action:

1. Call publicly for Jeff's reinstatement.
2. Instruct the APS representatives on the AIP Governing Board to press for Jeff's reinstatement.

To date, there has been no serious investigation of Jeff's case by any APS official, as evidenced by the simple fact that no one from APS has ever contacted Jeff to give him the opportunity to address whatever issues APS deems decisive in the case.

When we looked into Jeff's dismissal ourselves, we concluded that it was a clear case of suppression of dissent — a reprisal for Jeff's critical research and writing about physics education and professional careers, and in particular for his views on workplace practices and working conditions at *Physics Today*. A revealing statement by AIP CEO Marc Brodsky, prompted by protests against Jeff's firing, confirmed for us that we hadn't missed any significant facts when we assessed the matter.

While at *Physics Today*, Jeff consistently completed his work far ahead of deadline, invariably received job performance ratings of "Meets job requirements" or "Exceeds job requirements," and was widely praised for the quality of his work. The evidence indicates that Jeff would still be employed by *Physics Today*, just as he had been for 19 years, if he had not been a workplace activist and if he had written but not published *Disciplined Minds*. As far as we know, no AIP manager has disputed this,

either publicly or privately. Therefore, we conclude that Jeff was fired for expressing critical views within the physics community. Ironically, reviewers have treated his book as a valuable contribution. (See, for example, the review in the APS Forum publication, *Physics and Society*, July 2002, and the author interview in the APS Division of Biological Physics publication, *The Biological Physicist*, October 2001.)

Jeff's treatment like a heretic reflects poorly on our organization and undermines the science community's efforts to be seen by the public as open-minded. We would like to work with you to make sure that the next round of publicity in this case is positive — based on a clear demonstration by APS that physicists will not tolerate the exclusion of critical views from debate within the physics community. We are sure that you, as a fellow physicist, share our high expectations for our organization.

Jeff has not taken his dismissal to court, preferring first to give individuals and organizations such as APS the opportunity to speak out publicly for justice. Forgoing this opportunity would take the matter out of the hands of the physics community and would likely put APS in the awkward position of co-defendant. (When Jeff was fired, he was banned from APS headquarters as well as AIP headquarters, being told never to reenter the American Center for Physics "at any time, for any reason.") What would APS's lawyers say? "Firing Jeff was perfectly legal"? "It's all AIP's fault"?

APS is known for speaking out when scientists in other countries suffer reprisals for expressing their views. We must not give repressive foreign authorities the opportunity to question our credibility and dismiss our protests as hypocritical because we are silent about repression within our own organizations.

We will, of course, report the Council's response in this case to the hundreds of concerned APS members, physics graduate students, and people outside of physics who have been following the case with great interest. Thus, this is not only an opportunity to do something for justice close to home, but also an opportunity for APS leaders to build their reputation among both physicists and human rights activists.

Enclosed is a copy of the human rights committee report mentioned above. Marc Brodsky's statement to the committee (and to others) is posted on the web at <http://disciplinedminds.com>. We asked Jeff if he had any testimonial evidence from physicists that he did good work at *Physics Today*, and a copy of what he sent us in response is enclosed. We thought you would also appreciate the perspective of the enclosed article from *Physics World* magazine.

We would appreciate hearing your views. Please feel free to contact any of us — our addresses and telephone numbers are at the top of this letter. We would, of course, be happy to provide additional information. We have written to other members of the Council to ask their views, too. Please feel free, as well, to contact Jeff directly, at 202-537-3645 or jeffschmidt@alumni.uci.edu.

Best regards,



For Talat Rahman, Michael A. Lee, George F. Reiter, Denis G. Rancourt, and Fay Dowker

Excerpt from Physics Today Advisory Committee report

From: Stephen Benka
To: ALL-PT
Date: 15 Nov 1996 (Fri) 17:08
Subject: Advisory Committee report

The PT Advisory Committee report is here. More grist for the mill.
--Steve

Marc Brodsky, Executive Director & CEO
John Rigden, Director of Physics Programs
Charles Harris, Publisher
Stephen Benka, Associate Editor

Please find attached the final version of the 1996 Report of the Advisory Committee of PHYSICS TODAY. This report is written in the spirit of providing the committee members' best advice to the management of PHYSICS TODAY to further develop and strengthen PHYSICS TODAY as the flagship publication of the AIP.

We are submitting the text of the report by e-mail as well as by regular mail in the hope that it reaches you in time for your planned off-site meeting.

In the name of all committee members, I thank the staff of PHYSICS TODAY for their hospitality during the October 4-5 meeting and their frankness in interactions with us.

With best wishes,
Horst Stormer

ps: A set of miscellaneous suggestions will be submitted by separate mail.

PHYSICS TODAY ADVISORY COMMITTEE MEETING (1996)

The 1996 Meeting of the PHYSICS TODAY Advisory Committee was held in the American Center of Physics building in College Park, Maryland on October 4-5, 1996. The meeting started at 8:50 a.m. and lasted until approximately 5:00 p.m. on Friday, October 4. On Saturday, October 5, the Committee members met in an executive session and briefed Marc Brodsky, Charles Harris and Stephen Benka on the Committee's recommendations. John Rigden was unable to participate.

The attendees during the Friday session were:

COMMITTEE MEMBERS: Don Anderson, Lawrence Crum, James Deye, Maurice Jacob, Larry Kirkpatrick, Dan Kleppner, Kumar Patel, Horst Stormer (chair) and Virginia Trimble.

PHYSICS TODAY: Stephen Benka, Graham Collins, Paul Elliott, Toni Feder, Charles Harris, Irwin Goodwin, Abby Klar, Richard Kobel, Warren Kornberg, Jean Kumagai, Ray Ladbury, Barbara Levi, Gloria Lubkin, Elliot Plotkin, Jeffrey Schmidt, Bertram Schwarzschild,

AMERICAN INSTITUTE OF PHYSICS: Marc Brodsky

During the October 1996 Meeting the Advisory Committee experimented with a new agenda. Previous meetings were held in plenary-fashion with all staff members and all committee members assembled throughout the Friday session. This year the Committee met sequentially

tracking of information about what is scheduled for upcoming issues and changes made in the schedule (current information should be maintained electronically), (ii) changes in format, style, and content of the magazine. The committee believes that it would be a positive step for management to inform the staff that formal attention is being devoted to improvement of management skills.

- c. Inequities in salaries -- Staff believes that pay rates in some cases are not proportionate to the kind of work done, the amount of work done, and seniority levels. Some attention should be given to a perceived inequity in part of the salary structure.

3. Poor Internal Vertical Communications:

As noted in last year's Committee Report, it was "felt there are some real or potential communication gaps, both among staff and the outside world". Alarming new evidence of internal communication problems arose in our talks with staff this year; especially with regard to vertical communications. Lateral communications amongst staff, on the other hand, seems to be open to the point that some are even aware of one another's salaries. With this channel so open and the management not aware and involved, one has a situation which breeds misinformation, rumors, and real or perceived grievances. The committee heard comments such as: "a lot of communications are concealed", "AIP management is willing to sacrifice quality for dollars", "there is only criticism from management", "there is significant inequity in editorial salaries", "management doesn't have a full array of skills", and "management is only willing to project a congratulatory image of physics".

We were also made aware of incidents which were indicative of an authoritarian style of management; e.g., hiring personnel without any consultation of those who will be working closely with the individual, changes in meeting schedules on short notice without regard to the impact this may have on those below, and managers taking management skills training without sharing this fact with the staff. In this last case, such sharing would help to alleviate the staff perception that management is lacking in such skills and just does not care. These or similar themes were common enough to indicate a problem which is a large contributor to poor morale and, hence, reduces efficiency of staff. The problem with vertical flow of information even exists at the higher levels where there was evidence that AIP management may not be sending clear and consistent messages to PT management; and hence PT management may not be able to adequately explain these issues to the PT staff. One example of a frustrating AIP communication's issue was the shutdown of PINET which caused a significant waste of time for some PT staff because it was not communicated very effectively. These sorts of problems have resulted in a "we(PT) vs they(AIP)" bunker mentality which can only disrupt communications even further.

Our recommendations concern three distinct communications channels:

- a. AIP to/from PT: There needs to be a consistent set of management goals established which deal with the issues of PT autonomy, both editorially and financially. Once agreed to, these policies should be communicated to staff and then consistently adhered to. At the very least the goals need to address AIP's long term commitment to PT, the expected quality and purpose of the publication, the openness of AIP management to the concerns of PT staff and its willingness to hear those concerns.
- b. PT managers to/from PT staff: A mechanism should be put into place to build trust and the flow of information. This may entail a greater use of e-mail to communicate (almost real time) the contents memo for upcoming issues and other operations memos in addition to more frequent staff meetings even if held by phone. PT management should empower employees by

From: "Jean A. Kumagai" <jak@interport.net>
To: ACP.AIP(JSCHMIDT,PELLIOT),ACP.ACPgate("tfeder@wam....
Date: 28 Apr 1998 (Tue) 17:54
Subject: Re: applicants

>Date: Tue, 28 Apr 1998 10:24:27 -0700
>From: Barbara Levi <bgl@worldnet.att.net>
>Organization: Physics Today
>MIME-Version: 1.0
>To: "Jean A. Kumagai" <jak@interport.net>
>Subject: Re: applicants

>
>I agree it would be good to send the job notice to women and minority
>physicist groups, so that we include the largest possible variety in our
>applicant pool. But I stop there. Our number one objective should be
>to get the very best person for the job. Period. If one of the top
>applicants happens to be a person of minority sex or race, fine. I
>think the fairest policy is a truly blind admissions procedure. In any
>case, Physics Today has an excellent record in hiring diversity.

>Barbara

>

>

>Jean A. Kumagai wrote:

>>

>> I too would like to see the resumes. I suggest that they be photocopied
>> and fedexed to those of us working off site. I also suggest that we take
>> affirmative action on this hire -- at the very least, sending the job ad to
>> women and minority physicist groups and identifying women and minorities
>> for the editing test and for interviewing.

>>

>> Jean

>>

>> At 4:32 PM -0400 4/27/98, toni feder wrote:

>> >HI Steve,

>> >

>> >I'd like to see the applications, but obviously won't have a chance to
>> >look and comment this week. If anyone at the office has time, perhaps
>> >he/she could make copies to fax or fedex me (and other telecommuters).

>> >

>> >Thanks,

>> >Toni

>

>--

>Barbara G. Levi bgl@worldnet.att.net

>Senior Editor 805 965 3483 (tel)

>Physics Today 805 963 2574 (fax)

>

Received: from amsterdam.interport.net
([199.184.165.9])
by acpgate.acp.org; Tue, 28 Apr 1998 17:54:33 -0400
Received: from [207.237.109.30] (usrts6p30.port.net [207.237.109.30])
by amsterdam.interport.net (8.8.5/8.8.5) with ESMTP id RAA08598;
Tue, 28 Apr 1998 17:54:26 -0400 (EDT)
Date: Tue, 28 Apr 1998 17:54:26 -0400 (EDT)
X-Sender: jak@pop.interport.net
Message-Id: <v03110703b16bc89cc17a@[207.237.104.214]>
Mime-Version: 1.0
Content-Type: text/plain; charset="us-ascii"
To: pelliot@aip.acp.org, tfeder@wam.umd.edu, jschmidt@aip.acp.org
From: "Jean A. Kumagai" <jak@interport.net>
Subject: Re: applicants

S 002167

From: "Alexander Hellemans" <hellemans@libero.it>
Received: from mx7.jersey.juno.com (mx7.jersey.juno.com [64.136.16.57])
by m4.jersey.juno.com with SMTP id AAA7L544VAVDA2RJ
for <jeff-schmidt@juno.com> (sender <hellemans@libero.it>);
Tue, 13 Mar 2001 04:41:39 -0500 (EST)
Received: from smtp1.libero.it (smtp1.libero.it [193.70.192.51])
by mx7.jersey.juno.com with SMTP id AAA7L544VARDVJ9S
for <jeff-schmidt@juno.com> (sender <hellemans@libero.it>);
Tue, 13 Mar 2001 04:41:39 -0500 (EST)
Received: from oemcomputer (151.26.25.145) by smtp1.libero.it (5.5.022)
id 3A9BFE14002F53A7 for jeff-schmidt@juno.com; Tue, 13 Mar 2001 10:41:38 +0100
Return-path: <hellemans@libero.it>
To: "Jeff Schmidt" <jeff-schmidt@juno.com>
Date: Tue, 13 Mar 2001 10:42:12 +0100
Subject: Talk to lawyers?
Message-ID: <015501c0aba1\$e8b90da0\$a9191a97@oemcomputer>
X-Status: Replied
X-Mailer: Microsoft Outlook Express 5.50.4522.1200

Hello Jeff,

Yes, I will be glad to talk to your lawyers. I did some freelance projects while being fully employed at Physics Today.

I was fully employed as an Associate Editor from May 1984 to August 1985, after that I worked as a consultant for Physics Today until 1987.

For Publishers Weekly I was the "guest editor" for their special issue on science books sometime in August. Unfortunately I don't have my old files here in Italy, and nothing is visible on the web. For this project I received phone calls, faxes and mail, at the office. I also wrote an article about scientific monographies, and even proposed a similar article to Physics Today. For this article I made photographs of a display of physics monographs in the cantine in the office of Physics Today. I even was helped by colleagues with creating a nice display. You can find this photograph in Publishers Weekly.

I don't have access to Publishers Weekly here in Italy, and perhaps you will have to do some research. Perhaps you could look up my name in something called (I believe) "The Readers Guide to Periodic Literature," which you can find in every library in the US (Issues appear several times per year, and are bundled in fat books), and look at what I did during that period.

Another free-lance job I did was actually passed on to me by someone at Physics Today, and discussed openly at the office. I wrote an article for the World Book Science Year some time in 1985 about solid-state physics. Although I wrote the article at home, I used resources at Physics Today (I made photocopies of papers from physics journals), as well as receiving mail from the publisher.

Perhaps it is best that your lawyer calls me (I'm home today and tomorrow), so that she prepared with questions. You can also show her this letter.

S 002168

Use the email address listed below (I have Compuserve now as a back-up

service). You or your lawyers can also send me faxes at the US (Efax) number listed below, and I can return signed documents via fax immediately.

Good luck, I will write soon about our adventures in Italy.

Best, Alex

Alexander Hellemans
Science Writer
Via Rivoli, 5
80079 Procida (NA), Italy
Tel.: +39 081 896 9128
Fax: +1 810 815 8211
E-mail: hellemans@libero.it

MARYLAND DEPARTMENT OF LABOR HEARING

Notes from the first part of the hearing — the interview of Jeff Schmidt by examiner Tasha Owens of the department's office of unemployment insurance (College Park office, 301-313-8990), 16 June 2000, 7:59 am to 8:27 am, by telephone.

Jeff Schmidt: Do you have any information from the employer?

Tasha Owens: I sure do.

Schmidt: Did they submit it in writing?

Owens: Yes, they did.

Schmidt: Can you tell me what the statement is?

Owens: This is the information your employer gave me. It was a very brief statement. They indicated, "The employee admittedly used company time to work on a personal project over an extended period of time." And that's it.

Now, what was the reason given to you for being discharged?

Schmidt: They gave essentially the reason that you read there.

Owens: That you were using company time to work on a personal project?

Schmidt: Right.

Owens: Do you agree with this reason?

Schmidt: No, I don't.

Owens: Any verbal, written warnings in relation to the reason you were discharged?

Schmidt: No.

Owens: Did you protest your discharge?

Schmidt: Definitely. I told them that it's unacceptable. And then later I let them know that I wanted my job back.

Owens: When they found out that you had written this book, on May 22nd, they questioned you about it that day?

Schmidt: They never questioned me about it.

Owens: They found out you wrote the book — and, what, they commented, you know, “Oh, we found out that you wrote a book”?

Schmidt: No, they never commented on the book — until they said that I was fired because of the book.

...

Owens: You said they told you that they found out that you had written a book. Did they have reason to believe that it was during company time?

Schmidt: They didn't have good reason to believe that. What they had was a statement in the book itself.

Owens: Ok. From this statement alone, they said that you had been doing...

Schmidt: Exactly.

Owens: ...Ok.

Schmidt: I told them that it wasn't true. But they wouldn't listen. They said, “We are not here to answer questions.” They wouldn't discuss anything at all with me....

I was ahead in my work by the standard that they set. They had said that I should do a certain amount of work in a year. And at the time they fired me I had just finished all of that work in ten months' time.

Owens: Who told you that you were doing well, that you were ahead in your work?

Schmidt: Stephen Benka and Randolph Nanna....

Owens: Was this recent?

Schmidt: It was within the current review period, which goes from September 1999 to September 2000.... So they can't claim that I didn't do what they asked me to do. In fact, they're not saying that I didn't do what they asked me to do, are they?

Owens: No, they're not.

Follow-up call by Jeff Schmidt to examiner Tasha Owens, 20 June 2000, around 10 am

Jeff Schmidt: You say they [AIP] didn't submit anything in writing?

Tasha Owens: No, I spoke to them, and they gave me the same information that you gave me. So I'll be making a decision and mailing it out to you.

Schmidt: Can you send me a copy of what they said?

Owens: I can send you a copy of the decision, but I can't send you a copy of the information that they gave me.

Schmidt: Can you tell me what they said?

Owens: Basically they're saying the same thing, the same information you gave me — that they saw in your book a statement that the book had been done on company time. And they're saying that that alone.

Also, [they cited] the fact that you had asked for reduced hours. But they didn't specify why you needed that time. And they did grant you reduced hours. So, you know, it's really not telling me that the reason you wanted [reduced hours] was to finish your book. They just said that you did ask for reduced hours. This was another reason why they felt that you were doing it on company time — because you asked for reduced hours. You didn't say what it was for; you just asked for reduced hours. And they granted you the request, so. That's basically the information that they gave me. And they could not say what hours you spent doing the book. They don't know. So that's the information I have. I have enough information to make my decision.

Schmidt: I noticed that you didn't call me this morning during the appointed time.

Owens: That's the reason why I didn't call you — because that was the information they gave me, and there was nothing to rebut.

Schmidt: What is the timing of the decision?

Owens: The decision will be made this week. And you'll receive it in the next couple of days.

MARYLAND DEPARTMENT OF LABOR HEARING

Notes from the first part of the hearing — the interview of Jeff Schmidt by examiner Tasha Owens of the department's office of unemployment insurance (College Park office, 301-313-8000), 16 June 2000, 7:59 am to 8:27 am, by telephone.

Jeff Schmidt: Do you have any information from the employer?

Tasha Owens: I sure do.

Schmidt: Did they submit it in writing?

Owens: Yes, they did.

Schmidt: You know, I never got a copy of that.

Owens: Well, it's a statement. They didn't send me a termination letter or anything.

Schmidt: Can you tell me what the statement is?

Owens: This is the information your employer gave me. It was a very brief statement. They indicated, "The employee admittedly used company time to work on a personal project over an extended period of time." And that's it.

Schmidt: Are they trying to deny me this benefit?

Owens: Well, at this point I don't know. This is all the information they indicated. I do need to talk to them further, to get further information from them, as to what they meant by that — what was it that you were working on. At that point I will make a decision on your case.... Some employers do send us information and indicate that they do not wish to dispute the claim. But in this case your employer did not indicate anything other than the reason why you were terminated.

Now, what was the reason given to you for being discharged?

Schmidt: They gave essentially the reason that you read there.

Owens: That you were using company time to work on a personal project?

Schmidt: Right. Although they never actually said it that way.

Owens: What way did they say it?

Schmidt: What they said was that I wasn't fully engaged at the magazine. Those are their exact words. They didn't use the words that they gave to you. Their exact words — they said, "You weren't fully engaged at the magazine."

Owens: Do you agree with this reason?

Schmidt: No, I don't.

Owens: Any verbal, written warnings in relation to the reason you were discharged?

Schmidt: No.

Owens: Did you protest your discharge?

Schmidt: Definitely. I told them that it's unacceptable. And then later I let them know that I wanted my job back.

...

Schmidt: ... It occurred on Monday the 22nd of May, 2000.

Owens: What happened on that day.

Schmidt: That day they found out that I had written a book.

Owens: ... Were you writing it on company time?

Schmidt: I wrote it only in my spare time.

Owens: Did you finish the book on the 22nd, or you were still writing this book?

Schmidt: It was finished by then....

Owens: They thought that you had written it during the time when you should have been working?

Schmidt: Right. But I always did my work, and they always gave me good reviews.

Owens: When they found out that you had written this book, on May 22nd, they questioned you about it that day?

Schmidt: They never questioned me about it.

Owens: They found out you wrote the book and, what, they commented, you know, "Oh, we found out that you wrote a book"?

Schmidt: No, they never commented on the book — until they said that I was fired because of the book.

Owens: But they told you that they knew that you had written this book? That they knew about the book?

Schmidt: Yes. That's the reason that they cited for firing me.

Owens: You said they told you that they found out that you had written a book. Did they have reason to believe that it was during company time?

Schmidt: They didn't have good reason to believe that. What they had was a statement in the book itself.

Owens: Ok. From this statement alone, they said that you had been doing...

Schmidt: Exactly.

Owens: ...Ok.

Schmidt: But the statement was a statement at the very beginning of the book that was there for dramatic effect, and in fact I never spent more time than somebody would spend, say, taking a walk to the water cooler or, you know, all the things they allow people to do, like surfing the net or playing computer solitaire or making personal phone calls or exchanging personal e-mail....

Owens: But you did it during break time and not during the time you were supposed to be working.

Schmidt: Exactly. It was break time....

Owens: When they said that they read this in your book, that it had been done on company time, you told them that it was for dramatic effect?

Schmidt: It didn't say it had been done on company time. It said it had been written *in part*. But they never asked me, "Well, what part?" you know — "How much time?" And they never asked, "Are you just trying to have a catchy introduction to your book?" No, they never asked me anything.

Owens: But did you explain that to them?

Schmidt: I told them that it wasn't true. But they wouldn't listen. They said, "We are not here to answer questions." They wouldn't discuss anything at all with me.

Owens: [Typing]

Schmidt: You know the employer sets the standard on how much work the employee has to do?

Owens: Yes.

Schmidt: I was ahead in my work by the standard that they set. They had said that I should do a certain amount of work in a year. And at the time they fired me I had just finished all of that work in ten months' time.

Owens: Who told you that you were doing well, that you were ahead in your work?

Schmidt: Stephen Benka and Randolph Nanna....

Owens: Was this recent?

Schmidt: It was within the current review period, which goes from September 1999 to September 2000. They told me how pleased they were with how well I was doing. ... So they can't claim that I didn't do what they asked me to do. In fact, they're not saying that I didn't do what they asked me to do, are they?

Owens: No, they're not.

Follow-up call by Jeff Schmidt to examiner Tasha Owens, 20 June 2000, around 10 am.

Jeff Schmidt: You say they [AIP] didn't submit anything in writing?

Tasha Owens: No, I spoke to them, and they gave me the same information that you gave me. So I'll be making a decision and mailing it out to you.

Schmidt: Can you send me a copy of what they said?

Owens: I can send you a copy of the decision, but I can't send you a copy of the information that they gave me.

Schmidt: Can you tell me what they said, when your computer is working again?

Owens: Well, I can tell you what they said, right now.

Schmidt: Great.

Owens: Basically they're saying the same thing, the same information you gave me — that they saw in your book a statement that the book had been done on company time. And they're saying that that alone.

Also, [they cited] the fact that you had asked for reduced hours. But they didn't — the reason why I didn't call you back on that is because they did not specify why you needed that time. And they did grant you reduced hours. So, you know, it's really not telling me that the reason you wanted [reduced hours] was to finish your book. They just said that you did ask for reduced hours. This was another reason why they felt that you were doing it on company time — because you asked for reduced hours. You didn't say what it was for; you just asked for reduced hours. And they granted you the request, so.

That was the information that they gave me. And they could not say what hours you spent doing the book. They don't know.

So that's the information I have. I have enough information to make my decision.

Schmidt: I noticed that you didn't call me this morning during the appointed time.

Owens: That's the reason why I didn't call you — because that was the information they gave me, and there was nothing to rebut.

Schmidt: What is the timing of the decision?

Owens: The decision will be made this week. And you'll receive it in the next couple of days.

TRENDS IN ELECTROMECHANICAL TRANSDUCTION

FIRST PAGES
2 JUN 98

Nicely
done!

SB 6/2/98

31

In today's world, it is nearly impossible to avoid contact with electromechanical sensors and actuators over the course of the day, although we rarely recognize them. They drive the keyless entry systems, the light switches that respond to sound or motion, the detectors in cars that determine whether seat belts are fastened and the sound-receiving and sound-generating parts of the telephone, to name just a few examples.

Electromechanical transducers are devices in which one connection to the environment conducts electrical energy and another conducts mechanical energy. Examples include microphones, loudspeakers, accelerometers, strain gauges, resistance thermometers, solenoid valves and electric motors.

There are many ways to categorize transducers. The largest breakdown divides them into sensors and actuators. Transducers used to monitor the state of a system, ideally without affecting that state, are sensors. Transducers that impose a state on a system, ideally without regard to the system load (the energy drained by the system), are actuators. However, this division, although useful, doesn't get to the heart of what makes transducers work.

It is useful to consider transducers from the perspective of energy conversion mechanisms, an approach that also yields two broad classes of devices: those based on geometry and those based on material properties. An example of a geometry-based transducer is a condenser microphone, which is a parallel-plate capacitor with a DC voltage bias between the plates. Sound causes one of the plates to move, thus changing the gap between the plates. This change dynamically alters the capacitance and produces an output voltage. An example of a material property-based transducer is a piezoelectric accelerometer. Piezoelectric materials are those in which there is coupling between the electric field and the mechanical field so that imposed electric fields cause dimensional changes and applied material strains produce voltages. In a piezoelectric accelerometer, acceleration strains the transduction material, giving rise to an electric field that is sensed as a voltage. Of course, these two broad classes may be

The demand for more sophisticated sensors and actuators in industrial equipment and consumer products is behind today's push for new transducer materials and geometries.

By Ilene J. Busch-Vishniac

further refined either in terms of the function of the transducer (for example, sensing fluid flow) or in terms of narrower classes of energy conversion (for example, transduction based on piezoelectricity). The table on page 31 shows the main electromechanical transduction mechanisms. Here the definition of "mechanical" is very liberal, in-

cluding thermal and optical phenomena.

The 1970s and 1980s brought dramatic changes in electronics and signal processing techniques, but only modest changes in electromechanical transducers. As a result, transducers are commonly the least reliable and most expensive elements in measurement and control systems. For this reason, there is a growing emphasis on the field of transduction, and significant changes are beginning to emerge.

Pervasiveness

In the last few decades, electronics have been incorporated into products of all sorts. Their growth in consumer products has been driven by two phenomena: the public's perception that low-technology (nonelectronic) devices are not as good as high-technology devices, and the push for products with "intelligence."

Low-technology devices whose market is being overtaken by high-technology counterparts range from office equipment such as staplers and pencil sharpeners to kitchen appliances such as juice squeezers. In many cases, we are replacing purely mechanical functions performed under human control by automated electromechanical operations, leading to the introduction of sensors and actuators.

The growing market for intelligent products (those with a decision-making process) comes from the desires to automate some functions that people perform and to add functions that people cannot perform. For instance, although people can control room lights by hand, they often prefer to employ motion or sound detectors and control electronics instead. Examples of intelligent products that extend certain functions beyond standard human performance are smoke detectors, automobile airbags and clothes dryers with autodry cycles.

The growth in transducer markets has been rapid and is predicted to continue on its current pace through the turn of the century. The sensor market alone rose to become a \$5 billion a year industry by 1990, with projections for a \$13 billion worldwide market by the year 2000—an 8% annual growth rate over the decade.¹

ILENE BUSCH-VISHNIAC is Temple Professor of Mechanical Engineering at the University of Texas at Austin and a visiting professor of aerospace and mechanical engineering at Boston University.

From: Stephen Benka
To: jeff
Date: 15 Jul 1998 (Wed) 12:34
Subject: A call from Segev

Jeff,

I just spoke with Moti Segev, who is very appreciative of your efforts on his article. He's quite happy with the result.

Well done.

--Steve

S 002179

From: Toni Feder <tfeder@wam.umd.edu>
To: stephen benka <sbenka@aip.acp.org>
Date: 5 Oct 1998 (Mon) 19:00
Subject: Praise for Jeff & Gloria

Hi Jeff,

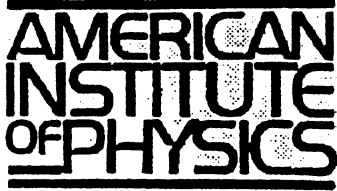
I saw Adrian Parsegian last week one evening when he was in Durham. He spoke extremely highly of you, saying how impressed he was with you, how articulate you are, and how much he enjoyed working with you on his article last year.

Just thought I'd pass this on....

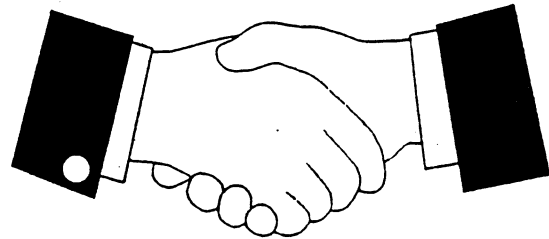
Oh, and while I'm at it, as I already told Gloria, in a conversation with MIT's Hale Bradt last week, he said he was generally impressed by PT, and recalled that some years back, he gave Gloria feedback on a "messed up" draft of a story on pulsars she'd sent him. He continued that he didn't see the article again until it appeared in print, and he was really impressed. "She got all the nuances right. She must be really good. I admire her."

Toni

S 002180



AIP INTER-OFFICE MEMORANDUM



To: Jeffrey Schmidt

From: T. C. Braun *TCB*

Extension: 2293

Date: February 8, 1999

Subject: Perfect Attendance

CONGRATULATIONS!!!! Our records indicate that you had perfect attendance for 1998. In accordance with our present policy, you have earned a cash incentive bonus of \$200 (subject to normal payroll taxes) and 2 bonus days. The bonus days must be taken within the year and may not be carried over into 2000. You will receive a separate check on payday, ~~25 February 1999~~. We thank you for your perfect attendance and wish you another healthy year in 1999.

17501-0

From: Stephen Benka
To: Barbara Levi, Bert Schwarzschild, Charles Day, E...
Date: Wed, Jul 14, 1999 1:38 PM
Subject: ASA cites PT articles

I just learned that the Acoustical Society of America's "Science Writing Award to a Professional" went to Ilene Busch-Vishniac for her July 1998 article in PT, "Trends in Electromechanical Transduction." Jeff was the editor.

The previous such award from the ASA went to Mathias Fink for his March 1997 article in PT, "Time-Reversed Acoustics." Bert was the editor.

Well done, and well earned.

--Steve

CC: Dr. James Stith, Gary Squires, Jeff Bebee, Marc...

S 002182

GRAVITATIONAL RADIATION AND THE VALIDITY OF GENERAL RELATIVITY

SB
8/27/99Nice
article

Observing the speed, polarization, and back influence of gravitational waves would subject Einstein's theory to new tests.

Clifford M. Will

While the detection of gravitational radiation may usher in a new era of "gravitational wave" astronomy (see the accompanying article by Barry Barish and Rainer Weiss, on page *****), it should also yield new and interesting tests of Einstein's general theory of relativity, especially in the radiative and strong-field regimes. Consequently, we are in an unusual situation. After all, we rarely think of *electromagnetic* astronomy as providing tests of Maxwell's theory. Neutrino astronomy may be a closer cousin: We can observe neutrinos to learn about the solar interior or about supernovae, while also checking such fundamental phenomena as neutrino oscillations. To some extent, the usefulness of astronomical observations in testing fundamental theory depends upon how well tested the theory is already. At the same time, since general relativity is the basis for virtually all discussion of gravitational-wave detectors and sources,¹ the extent of its "upfront" validity is of some concern to us.

Although the empirical support for the theory of general relativity is very strong, it is still not as solid as the support for Maxwell's theory, and only in the last 35 years or so have precise tests been feasible. Furthermore, general relativity has not been tested deeply either in its radiative regime or in the regime of strong gravitational fields, such as those associated with black holes or neutron stars. (See figure 1.) Most tests, such as those carried out in the Solar System, check the theory only in its weak-field, slow-motion, nonradiative limit. One famous exception, the Hulse-Taylor binary pulsar, does provide an important verification of the lowest-order radiative predictions of general relativity and is sensitive to some strong-field aspects. Still, important tests of gravitational radiation and its properties remain undone. Furthermore, interesting, well-motivated alternative theories to general relativity still exist that are in agreement with all observations to date. Gravitational-wave tests will remain of interest to us to the extent that they can further constrain the theoretical possibilities.

There are three aspects of gravitational radiation that can be subjected to testing:

▷ The polarization content of the waves (general relativity predicts only two polarization states, whereas other theories predict as many as six).

▷ The speed of the waves (general relativity predicts a speed the same as that of light, whereas other theories predict different speeds).

▷ The back influence of the emitted radiation on the evolution of the source.

In this article, we discuss the three possibilities. First, though, we review the current status of tests of general relativity.^{2,3}

The Einstein equivalence principle

At the heart of gravitational theory is a concept called the Einstein equivalence principle, which modernizes Newton's postulate of the equivalence of gravitational and inertial mass. It states first, that bodies fall with the same acceleration regardless of their internal structure or composition (this piece of the Einstein equivalence principle is called the weak equivalence principle), and second, that the outcome of any local nongravitational experiment is both independent of the velocity of the free-falling reference frame in which it is performed (local Lorentz invariance) and independent of where and when in the universe it is performed (local position invariance).

The Einstein principle implies that gravitation must be described by a theory in which matter responds only to the geometry of spacetime. Such theories are called metric theories. General relativity is a metric theory of gravity, but so are many others, including the "scalar-tensor" theory of Carl Brans and Robert Dicke, a theory based on earlier work by Paul Jordan. Strangely enough, string theory—a leading contender for a unified theory of particle interactions and for a quantum theory of gravity—does not strictly satisfy the metric theory definition. In string theory, matter can respond weakly to gravitation-like fields, in addition to responding to geometry. Consequently, testing the Einstein equivalence principle is a way to search for new physics beyond standard metric gravity.

To test the weak equivalence principle, we can compare the accelerations a_1 and a_2 of two bodies of different composition in an external gravitational field. The resulting measurements will yield the difference in acceleration divided by the average acceleration, $2|a_1 - a_2|/|a_1 + a_2|$, called the Eötvös ratio after Roland, Baron Eötvös of Vásárosnamény, whose pioneering tests of the weak equivalence principle at the turn of the century formed a foundation for general relativity.

The best test so far of the weak equivalence principle has been a series of experiments carried out at the

Spacetime

S 002183

CLIFFORD WILL (cmw@wuphys.wustl.edu) is chair of the physics department, and a member of the McDonnell Center for the Space Sciences, at Washington University in St. Louis, Missouri.

From: "Jeff Schmidt" <jschmidt@aip.acp.org>
To: ACP.AIP(sbenka)
Date: Mon, Sep 27, 1999 3:43 AM
Subject: Compliment from Jerry Bernholc

Steve --

I got this nice note from Jerry Bernholc.

-- Jeff

>>> Jerry Bernholc <bernholc@ncsu.edu> 09/26/99 04:15pm >>>

Thank you very much for your help with the article and for your excellent editing job! I have already received quite a few nice comments. A number of people remarked that it was very well written.

CC: ACP.AIP(JSCHMIDT)

S 002184

I like at least
the recent research
reference. See p. 5 for
a possibility.

This reads very well.

First pages
21 Jan. 00

SB
1/23/92

ATMOSPHERIC INFRASOUND

Imagine a world in which you could hear not just nearby conversations and the noise of traffic a few blocks away, but also the sound of blasting in a quarry in the next state, the rumblings of an avalanche or volcano a thousand miles away, and the roar of a typhoon halfway around the world. Fortunately, nature has spared our senses from direct exposure to this incessant din. But our relentless quest to extend our senses has yielded instruments that can do just that—and more. Waves of infrasound, sounds at frequencies too low for us to hear, permeate the atmosphere and offer us insights into natural and human-made events on a global scale.

The term infrasound was coined by following the convention adopted nearly two centuries ago for light waves. The invisible, longer waves below the red end of the visible spectrum were called infrared, and shorter waves beyond the violet end were called ultraviolet. ("Infra" and "ultra" are from the Latin, meaning "below" and "beyond," respectively.) The nominal range of human hearing extends from about 20 Hz to 20 000 Hz, so the inaudible sound waves with frequencies below 20 Hz were dubbed infrasound, while those above the upper limit of 20 000 Hz were named ultrasound. (Many animals can hear beyond the human limits, as described in the box on page *****.) Following the optical convention even further, frequencies just below 20 Hz are known as near-infrasound, and frequencies below about 1 Hz are often called far-infrasound. Near-infrasound, if sufficiently intense, is often felt rather than heard—as you might have experienced when you pass cars equipped with "mega-bass" audio systems.

Interest in atmospheric infrasound peaked during the Cold War as one of several ways to detect, locate, and classify nuclear explosions from global distances. Now, the Comprehensive Test Ban Treaty calls for a more sophisticated global sensor network to monitor compliance.¹ There is a need to ensure that tests of clandestine, low-yield nuclear devices can be detected under conditions of noise, cloud cover, or other masking situations underground, underwater, or in the atmosphere. An integrated global sensor array now being deployed would address this problem by coordinating observations from multiple ground-based sensor types, including seismic, hydroacoustic, and infrasonic arrays, working in concert. (See Jeremiah Sullivan's article on the Comprehensive Test Ban Treaty, PHYSICS TODAY, March 1998, page 24.)

In anticipation of a CTBT monitoring system, infra-

The search for ways to monitor compliance with the Comprehensive Test Ban Treaty has sparked renewed interest in sounds with frequencies too low for humans to hear.

Alfred J. Bedard Jr and
Thomas M. Georges

sound research has returned full circle to its origins. In this article, we review the science and technology of atmospheric infrasound, beginning with a brief history of its Cold War beginnings. Our focus, however, is on the richness of Earth's infrasonic environment, unheard and unknown until instruments were built to detect and record it. Practical applications of this new

science are just now being contemplated. (See figure 1, for example.)

A little history

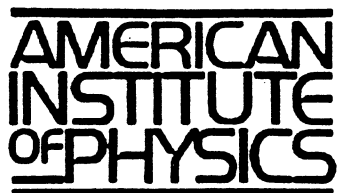
Pressure waves from very powerful explosions may be detected after traveling several times around the Earth. Two famous pre-nuclear instances were the explosion of the Krakatoa volcano in 1883 and the Great Siberian Meteorite of 1909. Following each of these events, sensitive barometers around the world recorded impulsive pressure fluctuations as traces on paper charts. Later, meteorologists collected these charts from stations around the world and, by comparing arrival times, were able to reconstruct the progress of pressure waves radiating outward from the source at the speed of sound, sometimes passing an observing station two or three times.

But these disturbances pale when compared with the political shock waves from the explosion of the first Soviet atomic bomb in 1949. Cold War fears stimulated a flurry of "remote sensing" research—much of it classified—to detect and locate nuclear explosions at global distances. Among the technologies explored during those early years of the Cold War were seismic arrays, electromagnetic (radio to gamma-ray) sensors, and arrays of microphones to listen to very-low-frequency sound waves in the atmosphere.

In the early 1950s, a number of institutions contributed to the successful deployment of a global infrasonic monitoring network. Lewis Strauss, in his book, *Men and Decisions*, describes recording low-frequency air waves at the National Bureau of Standards in Washington, D.C., following a 1954 nuclear test in the Pacific. He took the recording to President Eisenhower and played a sped-up version that made the recording audible. Strauss emphasizes the strategic importance, during those early Cold War years, of nuclear intelligence provided by a worldwide monitoring system that included both remote sensing and a radionuclide sampling program.²

Early defense-driven infrasound research had multiple foci, including mathematical models for the intensity and spectrum of sound waves generated by various kinds of explosions, how these waves propagate long distances through the atmosphere, what kinds of sensors would be best suited for detecting their signatures, and how those signatures could be extracted from a bewildering variety of natural and human-made infrasonic noise. The Limited Test Ban Treaty of 1963, which prohibits testing of

ALFRED BEDARD is a research scientist at the National Oceanic and Atmospheric Administration's Environmental Technology Laboratory, in Boulder, Colorado. THOMAS GEORGES is a research scientist at the NOAA/Colorado State University Cooperative Institute for Research in the Atmosphere, also in Boulder.



A I P INTER-OFFICE MEMORANDUM

To: Jeffery Schmidt/Physics Today

From: T. C. Braun *CCB*

Extension: 2293

Date: 11 February 2000

Subject: Perfect Attendance

CONGRATULATIONS!!!! Our records indicate that you had perfect attendance for the year 1999. In accordance with our present policy, you have earned a cash incentive bonus of \$200 (subject to normal payroll taxes) and two bonus days. The bonus days must be taken within the year 2000 and may not be carried over into 2001. You will receive a separate check on payday, 24 February 2000. We thank you for your perfect attendance and wish you another healthy year in 2000.

S 002186

From: "Johnson, Anthony" <johnsona@ADM.NJIT.EDU>
To: "jschmidt@aip.org" <jschmidt@aip.org>
Date: Sat, Apr 8, 2000 5:23 PM
Subject: Physics Today article

Dear Jeff:

I now have the galleys and I am quite impressed with how quickly you put together the two pieces. I am also quite happy with the editing of my submission. I only have one question and suggested minor change. The first paragraph of the article: The number of jobs posted that I received from Ed Goldin, shortly after the OFC conference was 2000. Is it safe to assume that the 3400 number that you are using is the updated number and not a typo? If all is well then this is an even more dramatic sign of opportunity in the field and warrants more accentuation. I suggest italics and an exclamation point for the following: " ... 11 jobs per seeker!"

You've done a wonderful job and I have no further changes or comments. I will be visiting the School of Optics at the University of Central Florida on Monday and Tuesday and if you should need to get hold of me for some reason, my hosts are Professors Eric Van Stryland and George Stegeman. The Administrative Assistant at the School of Optics is Sarah Pimentel (Tel: 407-823-6916).

Best Regards,

Anthony

CC: "sbenka@aip.org" <sbenka@aip.org>, "Crawley, Re...

S 002187

Jeff, this article is very good—
you've brought it a long way. —Steve

25 pages
16 Nov. 99

SB

11/17/99

MOTILE BEHAVIOR OF BACTERIA

Escherichia coli is a single-celled organism that lives in your gut. It is equipped with a set of rotary motors, each of which is only 45 nm in diameter and drives a long, thin, helical filament that extends several cell body lengths out into the external medium. The assemblage of motor and filament is called a flagellum. The concerted motion of several flagella enables a cell to swim. A cell can move toward regions that it deems more favorable by modulating the direction of rotation of its flagella. It does this modulation by measuring changes in the concentrations of certain chemicals in its environment (mostly nutrients) and deciding whether life is getting better or worse. Thus, in addition to rotary engines and propellers, *E. coli*'s standard accessories include particle counters, rate meters, and gear boxes. This microorganism is a nanotechnologist's dream. Let us examine the features that make it so, from the perspectives of several scientific disciplines: anatomy, biology (genetics), chemistry, and physics.

What made the discovery of *E. coli* and its properties possible? The tale has two geneeses. One involves light microscopy and begins in the 17th century, when Antoni van Leeuwenhoek first observed swimming bacteria.¹ (See box 1.) The other involves molecular genetics and begins in the 20th century, when Joshua Lederberg demonstrated that bacteria have sex, as evidenced by their genetic recombination.² (See box 2.) Lederberg studied *E. coli* and *Salmonella typhimurium*, two closely related organisms. They are the principal subjects of work now being done on bacterial chemotaxis (the motion of bacteria toward chemical attractants or away from chemical repellents). That work has yielded an important model for understanding organisms' behavior at the molecular level.

Anatomy of *E. coli*

E. coli (like *S. typhimurium*) is a cylindrical organism with hemispherical endcaps (as figure 1 shows). The cell, which weighs only 1 picogram, is about 70% water. Some strains are flagellated and motile; others are nonflagellated and nonmotile. When motile cells are grown in a rich medium (such as salts plus a mixture of amino acids), they swim in the direction of their long axis at a rate of about 35 diameters per second, often changing course but rarely stopping.

The chromosome of *E. coli* consists of a single double-stranded chain of DNA about 700-times longer than the body of the cell. There are 4 639 221 base pairs specifying 4288 genes, most of which encode proteins.³ The functions

E. coli, a self-replicating object only a thousandth of a millimeter in size, can swim 35 diameters a second, taste simple chemicals in its environment, and decide whether life is getting better or worse.

Howard C. Berg

of only about 60% of these genes are known. About 50 different kinds of proteins are required to produce the cell's chemotaxis, roughly half for the assembly of flagella and half for behavioral control.

When *E. coli* grows, it first gets longer and then divides in the middle. In a sense it is immortal, because

the mother cell is replaced by two daughters, essentially identical to the daughters of the previous generation. The molecules of DNA in the members of a given set of descendants are identical except for mutations, which occur spontaneously for a given gene, at the rate of about 10^{-7} per generation.

If well fed and held at the temperature of the human gut (37 °C), *E. coli* can synthesize and replicate everything it needs to make a new copy of itself in about 20 minutes. Thus, if we start at noon today with one cell (and lots of food), by noon tomorrow there will be $2^{72} = 4.7 \times 10^{21}$ cells—enough to pack a cube 17 meters on a side! This replication rate explains why single cells dispersed on the surface of the hard form of nutrient agar soon become mounds of cells (colonies) a millimeter or so in diameter and why, in soft agar, the motile progeny of a single cell soon populate the entire plate.

Genetic analysis

A fully functional cell line, or strain, found in the wild is called a wild type. If a mutant cell is found that is missing a particular function, the gene carrying the mutation is named for that missing function. For example, a *che* gene is one encoding a protein (polypeptide) required for chemotaxis. A cell with such a defect develops flagella and swims, but it does not respond normally to chemical stimuli. The first gene of this type to be identified is called *cheA* (in italics), the second is called *cheB*, and so on through the alphabet. When the protein encoded by the gene is identified, it is called CheA (capitalized and in roman type).

In bacterial chemotaxis, besides the *che* genes, we encounter *fla* genes, so named for their defects in the synthesis of flagella (these genes are now called *flg*, *flh*, *fli*, or *flj*, because there turned out to be more than 26). There are also *mot* genes, named for defects in motility, or generation of torque. And there are a variety of genes that specify specific chemoreceptors; one, for example, *tar*, is a gene encoding the chemoreceptor Tar, which is so named because it mediates taxis toward the amino acid aspartate and away from certain repellents. The soft-agar plate shown in box 2 was inoculated with wild-type cells at the top, cells of a *tsr* (the *s* stands for serine) strain at the right, cells of a *tar* strain at the bottom, and cells of a smooth-swimming *che* strain at the left.

HOWARD BERG is a professor of molecular and cellular biology, and of physics, at Harvard University in Cambridge, Massachusetts, and a member of the Rowland Institute for Science.

S 002188

had can
on either a
bit or left-hand page.

Another excellent article!
—Steve 11/23/99

First pages
23 Nov. 99

PHYSICS AND THE INFORMATION REVOLUTION

In the fourth century BC, a young man named Pythias was condemned to death by Dionysius, the tyrant of Syracuse, for plotting against him, but Pythias was granted three days' leave to go home to settle his family's affairs after his friend Damon agreed to take his place and be executed should Pythias not return. Pythias encountered many problems but managed to return just in time to save Damon. Dionysius was so struck by this remarkable and honorable friendship that he released them both.

The decades-old friendship between computer technology and physics has also been a remarkable and honorable one, and it, too, has produced salutary results. Present-day experimental and theoretical physicists depend on computing, and have incurred a debt that they have repaid many times over by making fundamental contributions to advances in hardware, software, and systems technologies. (Figure 1 shows an experimental computer and one of its developers.)

In this article, we discuss the physical and economic limits to the geometrical scaling of semiconductor devices that has been the basis of much of the computer industry's progress over the last 50 years. We then look at some of the options that may be available when we come up against fundamental physics barriers sometime after 2010.

Disruptive technology

The first stored-program electronic computer, ENIAC (the Electronic Numerical Integrator and Computer), was built in 1946. A major triumph for vacuum-tube technology, ENIAC could add 5000 numbers in one second. At that rate, it could calculate the trajectory of an artillery shell in only 30 seconds, whereas an expert human with a mechanical calculator would have needed some 40 hours to complete the task. The machine was large (see figure 2)—and expensive. ENIAC...

- ▷ Contained 17 468 vacuum tubes
- ▷ Weighed 60 000 pounds
- ▷ Occupied 16 200 cubic feet
- ▷ Consumed 174 kilowatts (233 horsepower)Ⓢ

The amount of energy ENIAC expended to compute a single shell trajectory was comparable to that of the explosive discharge required to actually fire the shell. ENIAC was still the fastest computer on Earth nine years later, when it was turned off because the US Army could no longer justify the expense of operating and maintaining it.

JOEL BIRNBAUM is chief scientist at Hewlett-Packard, in Palo Alto, California. STANLEY WILLIAMS is *****a or "the ***** senior principal laboratory scientist at Hewlett-Packard Laboratories.

Quantum physics holds the key to the further advance of computing in the postsilicon era.

Joel Birnbaum and R. Stanley Williams

Even in the early days of ENIAC, though, technologists dreamed of smaller, faster, and far-more-reliable computers. An article by a panel of experts in the March 1949 issue of *Popular Mechanics* confidently predicted that someday a computer as powerful as ENIAC would contain only 1500 vacuum tubes, weigh only 3000 pounds, and require a mere 10 kilowatts of power to operate. Such a machine would be about the size and weight of an automobile, said the experts, with power consumption to match. What was intended to be a bold projection seems quaintly conservative to us now. These days, a palmtop computer is thousands of times more powerful than the ENIAC was.

The reason for the experts' now-laughable error is that their prediction was based on the wrong foundation—reasonable extrapolation of the in-place vacuum-tube technology. The transistor, which had already been invented and represented a disruptive technology—that is, a technology that could totally displace vacuum tubes in computers, as electronic calculators later replaced slide rules—was completely ignored.

By 1949, after 40 years of development, vacuum-tube technology was mature, and the associated manufacturing infrastructure was enormous. In 1938 the vacuum tube had still been a decade away from its ultimate accomplishment. But already there was a significant search for something that would be better: a solid-state switch. The development of that switch required a great deal of basic research, both in materials purification and in device concepts.

Even though transistors as discrete devices had significant advantages over vacuum tubes and progress on transistors was steady during the 1950s, the directors of many large electronics companies believed that the vacuum tube held an unassailable competitive position.

Their companies were eventually eclipsed by the ones that invested heavily in transistor technology R&D and that were poised to exploit new advances. As we shall see, there are eerie parallels with the situation today.

Moore's law

Gordon Moore of Intel Corp was the first to quantify the steady improvement in gate density when he noticed that the number of transistors that could be built on a chip increased exponentially with time. (See figure 3.) Over the past 24 years, that exponential growth rate has corresponded to a factor-of-four increase in the number of bits that can be stored on a memory chip in every device generation of about 3.4 years—an increase of 16 000 times!

This exponential growth in chip functionality is closely tied to the exponential growth of the chip market,

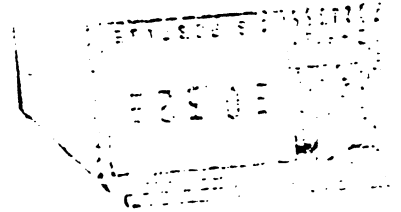
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S 002189

We appreciate your outstanding performance.

Steve

Cek

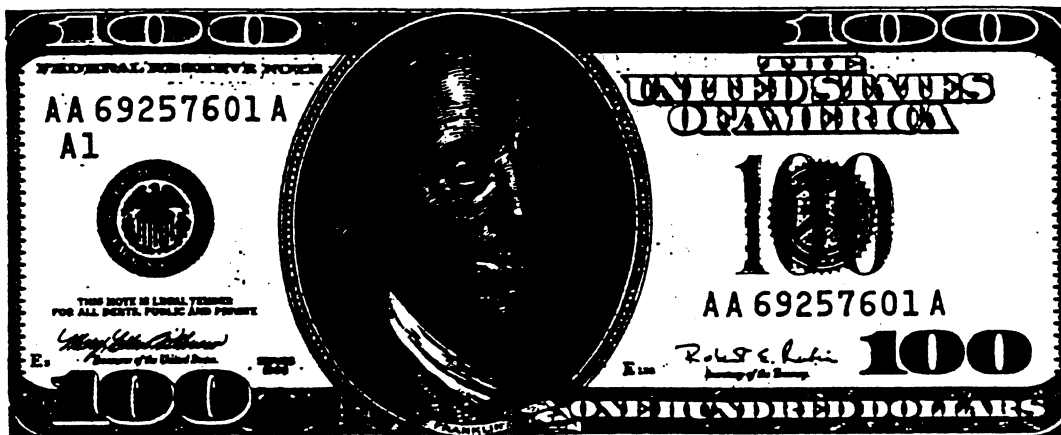


INTER - OFFICE MEMORANDUM

May 21, 1998

I, Jeffrey Schmidt, hereby acknowledge receipt of a cash "Pat on the Back" award in the amount of \$100. I understand that my year-end pay will reflect a "gross up" of this award.

J. Schmidt 23 May 98
Jeffrey Schmidt DATE



PHYSICS TODAY

from Gloria D. Lubkin

2/3/97

Steve Jeff,

Paul & Beverly,

Albert Wheelon ask
that if we receive
letters to the editor about
his article that we send
him copies.

He's very pleased with
the way his article
turned out:

From: Stephen Benka
To: JSCHMIDT, bgl
Date: 14 Feb 1997 (Fri) 17:24
Subject: Thought you'd like to know

Jeff, Barbara,

I just got a visit from my PhD advisor, who had a major complaint about about December issue. The Sikivie and Amato articles were "too damn good" and he spent far too much time with the magazine.

I thought you'd like to know. Kudos to you both.

-Steve

S 002193

From: "Martin L. Perl" <martin@SLAC.Stanford.EDU>
To: Jeff Schmidt <jds@aip.org>
Date: 2 Sep 1997 (Tue) 17:13
Subject: Leptons After 100 Years Article

Dear Jeff

Thank you for changing my ugly duckling of a manuscript into a beautiful swan. You have done a wonderful job.

I have the following comments:

Page 35, column 2: the ***** in "See box 1 on page ***** 36 has not been inserted yet.

Page 39, column 2: the ***** in "See box 2 on page ***** 40 has not been inserted yet.

Page 36, bottom equation in column 2: space required between virtual and Z^0 .

Page 38, Figure 4: TAU DETECTION scheme might be changed to TAU DETECTION apparatus.

Page 40, Box 2, column i: yes, each h should be an h -bar.

Page 40, References: the names in Ref. 3 are spelled correctly; in Ref. 10 the page number is 2074; in Ref 16 the page number is indeed 79c, it is a conference proceedings and every page has a c added to the page number.

Thank you so much Jeff for all your help and guidance. I am greatly looking forward to the issue.

Sincerely yours

Martin Perl

S 002194

From: Stephen Benka
To: jeff
Date: 5 Feb 1998 (Thu) 20:15
Subject: Sullivan & Barth

Jeff,

I've gone through both articles, and left them on your chair with my notes.

I think they make a great package for our readers. Thanks for your help getting them done in time.

--Steve

S 002195

From: Kai-Henrik Barth <barth002@tc.umn.edu>
To: Jeff Schmidt <jschmidt@aip.acp.org>
Date: 21 Apr 1998 (Tue) 11:05
Subject: reprints received

Dear Jeff,

I just came back from Europe and found the reprints of my article waiting for me on my desk in my university office. Thanks again for all your effort and time. I am very happy with the final product.

All the best
Kai

--

Kai-Henrik Barth
Program in History of Science and Technology
435 Walter Library
University of Minnesota
Minneapolis, MN 55455
612-626-8722 612-872-9323 (home)
barth002@tc.umn.edu
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MASSACHUSETTS INSTITUTE OF TECHNOLOGY
DEPARTMENT OF PHYSICS

DANIEL KLEPPNER
Lester Wolfe Professor of Physics

address: MIT
room 26-237
Cambridge, MA 02139

phone: 617/253-6811
fax: 617/253-4876
dk@ame.mit.edu

November 22, 1995

Dr. Stephen G. Benka
American Institute of Physics

Dear Steve,

I am sorry to be tardy in giving you feedback on PT, but let me start to catch up by commenting on the October issue. I will not comment on every item on your list, only on topics for which I have something to say.

General: the issue strikes me overall as strong. The cover is spectacular (though the title "sounding out the sun" is a trifle cutesy- particularly since one looks rather than listens), and the balance of articles is excellent- encompassing physics, geophysics, and biography.

PHYSICS UPDATE: interesting topics. However, the opening line "A silicon device for triggering a nerve cell has been constructed...." is pretty dull, as is invariably the case with the passive. The other reports have a zippier style. The AC suggested better graphical design for the page. One thought- develop a set of small logos- say for quantum mechanics, medical physics, materials, etc.- that would give a quick identification of the area while also adding visual interest. These could be small and placed in the margin. You might run a design contest to get suggestions from the readers. That could be done electronically. You would have to think carefully whether it is worth the effort, but it might drum up reader interest.

REFERENCE FRAME. Preachy.

S 002197

LETTERS: The letter of Seaborg et al demolishes Gabbard's hypothesis, which raises the question of how Gabbard's letter got published in the first place. I haven't gone back to read it, but even Gabbard now disowns it. A more rigorous scientific review of his letter would have saved confusion. More seriously with respect to this column, the letters of Hayden, Ravnik and Cohen take up lots of space and do not add anything new. Your readers should not be led, as I was, to read a long correspondence and then find that most of it is simply overkill. In my opinion, PT should have published the Seaborg letter, a brief note to say that Hayden, Ravnik and Cohen had come to similar conclusions, and Gabbard's reply.

Ershkovich's letter on Sagdeev reinforces my view that Alpert's attack on Sagdeev was irresponsible and that PT was irresponsible in publishing it.

ARTICLE- QUANTUM INFORMATION...: This is a fascinating topic and Bennett writes with great authority. However, I must confess that I found it too difficult to follow. Perhaps that is the nature of the beast. However, the graphics are attractive and that always makes one feel friendlier.

ARTICLE- HELIOSEISMOLOGY. Once again, the topic is fascinating. In this case I thought that I could understand it, but the text did not grip me. Too often it turned into a catalog of facts. ("Three ground-based networks of imaging helioseismological instruments are in various stages of development.")

ARTICLE- SCHWINGER. I saw this paper in the manuscript stage and thought that it was very disappointing. However, in PT it is absolutely first rate. The pictures, particularly Rabi, Schwinger and Weisskopf, add a great deal, the title was improved, and I suspect there was some editing. In any case, I enjoyed this immensely.

CAREER CHOICES. This is an excellent article, interesting in its own right and perfect for its goal of letting young physicists know the range of possibilities open to them.

BOOKS: The BEC volume is most timely, and makes a good headline for the section. The report of the Internet book points out that the book will be out of when the reader sees the review. Although the topic is pedestrian, the report provides a useful service. The new Feynman biography sounds pretty good but I question the need for yet another book. The review is relatively long. I would have opted for a briefer report. The book "Electric and Magnetic Interactions" is an undergraduate text. PT cannot hope to keep up with this category and should, in my opinion, leave it to AJP, which regularly reviews texts.

WE HEAR THAT: I am glad to hear of what is going on. I know that this column is not everyone's cup of tea, but it is mine.

OBITUARIES: The Ford obituary was extremely interesting to me. I knew Ford professionally but was never clear on what he had really done. He was somewhat of a joker which helped to obscure his accomplishments. The obituary is excellent. The other obituaries were also interesting to me as human documents. It is too bad that these stories must be told in a lugubrious context but I can't think of a suitable alternative.

I hope that these comments are useful. I will try to do the same for the November issue. However, if there are items for which you particularly want feedback, let me know and I will be sure to cover them.

Sincerely,



University of Illinois
at Urbana-Champaign

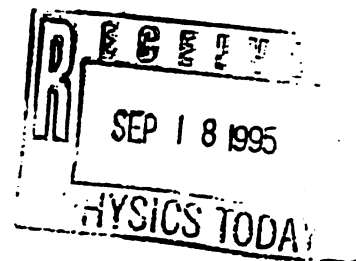
Department of Physics

Loomis Laboratory of Physics
1110 W. Green Street
Urbana, Illinois 61801

James P. Wolfe

Telephone: (217) 333-2374
Telefax: (217) 244-2278
E-Mail: j-wolfe@uiuc.edu

Jeff, FYI



September 8, 1995

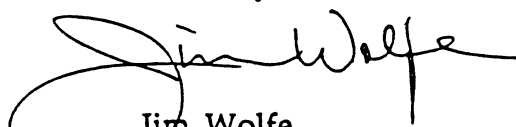
Stephen Benka, Editor
Physics Today
One Physics Ellipse
College Park MD 20740-3843

Dear Steve,

Many thanks to you and your staff for the excellent job you did with my article in the September 1995 issue of Physics Today. The graphics reproduced beautifully, and, of course, the cover is stunning. My interactions with Jeff Schmidt were very pleasant and constructive. The article benefitted greatly from your reviewers' suggestions; it is much better than the one I originally sent you.

The alliteration on the cover, "Seeing Sound in Solids," adds a nice touch. Thanks for inventing it. I will look forward to working with you again in the future.

Sincerely,


Jim Wolfe
Professor of Physics

S 002199

University of Illinois
at Urbana-Champaign

Department of Physics
Loomis Laboratory of Physics
1110 W. Green Street
Urbana, Illinois 61801

James P. Wolfe

Telephone: (217) 333-2374
Telefax: (217) 244-2278
E-Mail: j-wolfe@uiuc.edu

October 20, 1995

Jeff Schmidt
Physics Today
One Physics Ellipse
College Park MD 20740-3843

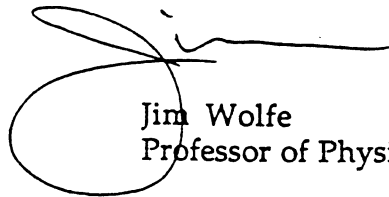
Dear Jeff,

Thanks for returning the graphics materials. It was a real pleasure working with you on the article. You and your staff did a terrific job.

I recently received a phone call from one of the organizers of the Acoustical Society Meeting (November, St. Louis) with a request to submit some of the "stunning" photos in Physics Today to their first Gallery of Acoustics. It is exciting to publish an article which has appeal to experts as well as (hopefully) the general reader.

I will look forward to working with you in the future.

Sincerely,



Jim Wolfe
Professor of Physics

S 002200

From famous physicist Abraham Pais (Einstein's biographer)

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PHONE: (+45) 3532 5200

PHONE, direct (+45) 353 25

TELEFAX, national: (31) 42 10 16

TELEFAX, internat: +45 31 42 10 16

TELEFAX

to:

Mr. Jeff Schmidt
2.

page 1 of:

Telefax no.:

001-301-2090842
6/2/94

date:

Ref.:

Dear Mr. Schmidt. Attached please
find corrections to my piece for Ph. Today.

I compliment you on your editing -

and on your excellent choice of pictures!

Perhaps it is too early to ask:

① How many free offprints

② How many can I order? Price?

I'd like them all with cover.

S 002201

Please contact if there are further
questions.

Best regards as to
Gloria
Abraham Pais



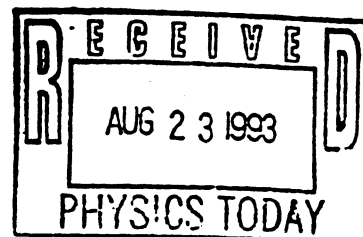
Department of History

West Virginia University

College of Arts and Sciences

From science historian
John Lankford

20 August 1993



Dr. Gloria B. Lubkin
Editor
Physics Today
335 East 45th Street
New York, NY 10017

Dear Dr. Lubkin:

Thanks for yours of 4 August inviting Rick Slavings and myself to contribute a paper on "The Industrialization of American Astronomy, 1890-1940." We accept with great pleasure.

There is, however, one problem. My wife has been offered a deanship at University of Nebraska-Lincoln and the powers that be are working on a professorship for me. This process is still in an early stage, but may consume a fair amount of my attention and energy this fall. If the matter has a happy ending (and Nebraska would be a good venue for both of us), the new jobs will begin 1 January 1994. This entails moving. Of course, with the prospect of moving to College Park facing you and the PT staff, I need hardly say that even in the best of organizations, there will be some disruption and slippage. Thus I am not able to give you an exact date for delivery of a manuscript. I will do so just as soon as things become clear on this end. Late winter 1994 will be my goal. Earlier if possible.

S 002202

Lankford to Lubkin, 20 August 1993

I have been reading on the topic of Big Science and want to recast the paper as follows. The new title would be something like: **THE MAKING OF BIG SCIENCE: THE INDUSTRIALIZATION OF AMERICAN ASTRONOMY, 1880-1940**. And we would begin with a paragraph placing the problem in the context of the history of big science. This will be done with appropriate references to physics as the exemplar of Big Science. The literature suggests that a major problem is understanding the pre-1940 roots of Big Science in America and this paper will be aimed at that problem. If all goes well, I will use this problem as the topic for my seminar at Nebraska when I go to interview. A little pre-testing feed back is always useful.

I hope that Jeff Schmidt will be assigned to work with me once you have the manuscript. He is first-rate and we worked very well together on the 1990 paper.

Sincerely,

A handwritten signature in black ink, appearing to read 'John Lankford', written over the word 'Sincerely,'.

John Lankford
Professor of the History of Science

S 002203

University of Illinois at Urbana-Champaign

College of Engineering
MATERIALS RESEARCH LABORATORY
104 S. Goodwin Ave.
Urbana, Illinois 61801
(217) 333-1370

May 14, 1982

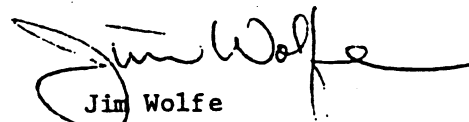
Dr. Tom von Foerster
PHYSICS TODAY
335 East 45th Street
New York, New York 10017

Dear Tom:

After sampling my approximate need, I would like to order 500 reprints of my PHYSICS TODAY article entitled, "Thermodynamics of Excitons in Semiconductors." This would include black-and-white article with four-color cover. Since the article is 8-1/3 pages, I estimate from your guideline sheet that the charge would be $\$110 + 4 \times \$17 = \$178$ plus cover at $\$230 + 2 \times \$26 = \$282$ for about \$460 total cost, plus some cost for 200 covers you now have. If this estimate is far off, let me know; otherwise, please initiate the order.

I am very pleased with the final product. The cover photo reproduced very well and the article and figures came out nicely. I was pleased with the interest and knowledgeability of Jeff Schmidt, whose thorough reading of the manuscript and interest in the material helped to make the article more readable. Thanks.

Sincerely,


Jim Wolfe
Professor of Physics

JW:dj

RECEIVED
MAY 21 1982
PHYSICS TODAY

S 002204



UNIVERSITY OF OREGON

May 14, 1984

Jeff Schmidt
Associate Editor
Physics Today
335 East 45 Street
New York, NY 10017

Dear Jeff:

With reference to your letter of May 9 and my telephone reply, I want to put in writing how very grateful I am for the superb editing job that you did on our article on atomic physics with synchrotron radiation. I wish I could write like that!

Will it be possible to order a few reprints, or extra copies of the June issue?

With best regards,

Sincerely,

A handwritten signature in cursive script, appearing to read "Bernd".

Bernd Crasemann
Professor of Physics

BC:sh

S 002205



The University of Wisconsin - Milwaukee

MILWAUKEE, WISCONSIN 53201
PHONE: (414) 963-5765, 4474

LABORATORY FOR SURFACE STUDIES
DIRECTOR: David S. Y. Tong

October 29, 1984

Dr. Harold L. Davis, Editor
Physics Today
335 East 45th Street
New York, NY 10017

Dear Harold:

Just a note to let you know that since the publication of my article, "Exploring Surface Structure" in Physics Today, I have received many responses. Most of the responses are from people that I have never met. This indicates how popular your journal is. One response characterized Physics Today as a "widely read and influential" journal.

I would like to take this opportunity to thank you for asking me to write the article. Also, I would like to thank Jeffrey Schmidt for his excellent editing work.

On the other hand, some comments from colleagues complain that their names or work were left out of the article. Incidentally, most of the complaints came from West Germany (I do not know the significance of this). I remember the difficult hours Jeffrey and I spent on cutting out names and paragraphs from the original draft. However, it is difficult to convince a colleague that a non-expert cannot care less for a name. They point out that department chairmen and industrial managers read these articles to judge the performance of their staff.

Surface structure is an active and dynamic area. Of the 26 surface techniques that I discussed in the article, I feel many of them deserve full length articles in your journal. I would support such future articles to be written by various authors.

Finally, I have ordered reprints and complimentary copies but have not yet received them. Could someone check on this for me please?

With best regards,

Yours sincerely,

S. Y. Tong
S. Y. Tong

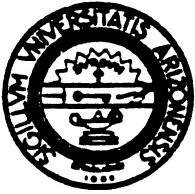
RECEIVED

NOV 7 1984

PHYSICS TODAY

SYT:da

S 002206



THE UNIVERSITY OF ARIZONA

TUCSON, ARIZONA 85721

602/621-6970

LUNAR AND PLANETARY LABORATORY

February 22, 1985

Mr. Jeff Schmidt, Assoc. Editor
PHYSICS TODAY
335 E. 45th St.
New York, NY 10017

Dear Jeff:

With this letter I thank you for your help with the article on asteroids and comets in the February issue. I have had much editing experience myself, for the Space Science Series books of the University of Arizona Press, and it is through this training that I can appreciate the exceptional job you have done.

There was a considerable amount of rewriting that you guided me into patiently and the article is much better than my original version. Your thinking through the material and your questions step by step have actually clarified the material for me; where I had made a statement carelessly you would bring me up and bring about a clearer version.

I also admire your patience. Until the very end, with the material already set, I kept asking you for additions and changes because the field is changing so fast. You allowed all of these and I am most grateful.

If you ever want to move out West, we would love to have you at the Press and we could surely use your competence.

With best regards,


Tom Gehrels

TG/sm
cc: Dr. H. L. Davis

P.S. Would you have a few reprints of the article or a few February issues for me? As we discussed on the phone, I would now like to send this to the Soviet Union where there is an interest in publishing a translated version of the article.

S 002207

RÉPUBLIQUE FRANÇAISE

Jeff

COMMISSARIAT A L'ÉNERGIE ATOMIQUE

SERVICE DE PHYSIQUE
DU SOLIDE ET DE RÉSONANCE MAGNÉTIQUE

ORME DES MERISIERS - 91191 GIF-SUR-YVETTE CEDEX FRANCE

TÉLEX : ÉNERGAT SACLAY 690641 F

5 March 1986

Dear Gloria,

I was very pleased that my article was accepted for Physics Today without any major revision. I enjoyed interacting with Jeff Schmidt, and felt that he significantly improved the quality of the manuscript. I look forward to seeing the March issue.

With best wishes,

Yours sincerely,

John Clarke

RECEIVED

MAR 12 1986

PHYSICS TODAY

S 002208

UNIVERSITY OF CALIFORNIA, SAN DIEGO

BERKELEY • DAVIS • IRVINE • LOS ANGELES • RIVERSIDE • SAN DIEGO • SAN FRANCISCO



SANTA BARBARA • SANTA CRUZ

DEPARTMENT OF PHYSICS, B-019
LA JOLLA, CALIFORNIA 92093

April 14, 1986

Ms. Gloria B. Lubkin, Editor
Physics Today
335 East 45 Street
New York, N. Y. 10017

RECEIVED

APR 21 1986

PHYSICS TODAY

Dear Gloria,

It is unfortunate that our paths didn't cross during the March APS meeting in Las Vegas. Hopefully, I will have another opportunity to see you some time in the near future.

I am writing to thank you for inviting me to contribute the article "Novel Types of Superconductivity in f-Electron Systems" for Physics Today. I am very pleased with the way the article turned out, and I enjoyed working with you and Jeff Schmidt on it. I had the opportunity to meet Jeff in Las Vegas, to tell him how much I liked the article, and to thank him for his considerable effort he put into its preparation.

With best regards,

Sincerely,

Brian

M. Brian Maple

MBM:njm

S 002209



KUNGL. TEKNISKA HÖGSKOLAN
THE ROYAL INSTITUTE OF TECHNOLOGY

Stockholm, September 29, 1986

Department of Plasma Physics

Dr Gloria Lubkin
Physics Today
335 East 45 Street
New York, N.Y. 10017 USA

Dear Dr Lubkin,

I wish to thank you for the very nice presentation which Physics Today has given my paper "Plasma Universe". I believe that your publication will mean a breakthrough for the general understanding of plasma phenomena in astrophysics and the acceptance of ideas for which I have fought for more than 40 years.

Please convey my appreciation to Dr. Jeffrey D. Schmidt, with whom I have had a number of fruitful telephone conversations.

Yours sincerely,

Hannes Alfvén

Hannes Alfvén

RECEIVED

OCT 0 1986

PHYSICS TODAY

S 002210

FILE: NAGLE 377 QUEUE: TYP-OUT
IS: PT- FMT:
BY: J ;25/02,12:10 REV: ELLS ;12/03,08:41
12-MAR-87 09:24:14

11 March 1987, 3:30 pm.

This article has three tables.

Dr. Darragh Nagle and Dr. Mikkel
Johnson

Los Alamos National Laboratory
Mail stop H864

Los Alamos, New Mexico 87545
505-667-2971 (Nagle)
505-667-6942 (Johnson)

Dr. David Measday
Physics Department
University of British Columbia
6224 Agriculture Road

Vancouver, BC
Canada V6T 2A6
604-228-5098 (Measday)
604-228-3853 (physics department)

S 002211

Jeff -
You did a
nice job on
this article.
Kilner
3/13

QUEENS COLLEGE

of THE CITY UNIVERSITY OF NEW YORK

FLUSHING • NEW YORK 11367-0904

DEPARTMENT OF PHYSICS

TELEPHONE: 718-520-5000

March 31, 1987

Dr. Jeffrey Schmidt
PHYSICS TODAY
335 E. 45th Street
New York, NY 10017

Dear Jeff:

I want to thank you for your extraordinary efforts in ferreting out eye-grabbing photos of vehicle accidents. In fact, they captured my attention to the extent that I read the article yet again.

I think every aspect, the photos, layout, color, length, etc., have made a balanced and easily readable article. You have done a fine job of editing and I and my colleagues appreciate it.

Sincerely,



Arthur C. Damask
Professor

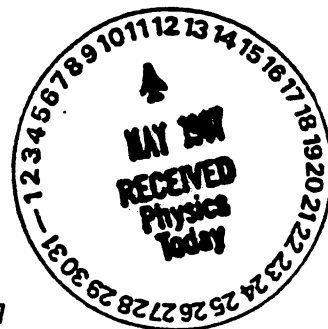
ACD:sa

S 002212



UNIVERSITY OF OREGON

Russell J. Donnelly
Professor of Physics
(503) 686-4226



May 5, 1987

Dr. Gloria Lubkin, Editor
Physics Today
140 East 45th Street
37th Floor
New York, NY 10017

Dear Gloria:

Now that my parts of the February and April Physics Today are published I want to thank you very much for making it all possible.

First of all, I thank you on behalf of the low temperature community for the nice series of articles on ^3He and ^4He . It was nice to think of being part of the good old low temperature community. Who the heck would have thought that by April superconductivity would be headed for temperatures created by ice and salt? I wonder what our friends will call themselves now?

I was also pleased by all the telephone calls on the Dana article. Not the least surprise was to find that Leo Dana is the person who got Dave Lazarus interested in science.

[I would especially like to thank Jeff Schmidt, who worked closely and thoughtfully with me to make it all become real.]

Yours sincerely,

Russell

Russell J. Donnelly

RJD:mcr
0401C

S 002213



AMERICAN INSTITUTE OF PHYSICS

335 EAST 45 STREET, NEW YORK, NEW YORK 10017 • Telephone (212) 661-9404

Telex 960983 AMINSTPHYS-NYK

KENNETH W. FORD
Executive Director and CEO

28 October 1987

To: Gloria Lubkin
From: Kenneth W. Ford *KW*
Subject: Canavan - Bloembergen-Patel debate

Congratulations to you and your staff on a superb job of presenting the Canavan vs. Bloembergen and Patel material. It is very effective and much more readable than standard "debate" formats. The PT lead-ins help too. I am very impressed by the job you have done.

KWF:lab

cc: John Rigden

▲
OCT 1987
RECEIVED
Physics
Today

S 002214

UNIVERSITY OF TOKYO

7-3-1 HONGO, BUNKYO-KU, TOKYO 113, JAPAN

FACULTY OF SCIENCE
DEPARTMENT OF PHYSICS

TELEPHONE: 03-812-2111
CABLE: TOKUNIV RIGAKU
TELEX: UTPHYSIC J23472

RECEIVED
Physics
Today
NOV 1987

13 November 1987

Dr. Gloria B. Lubkin
Editor, Physics Today
American Institute of Physics
335 East 45th Street
New York, NY 10017
U.S.A.

Dear Dr. Lubkin,

Thank you very much for your letter of November 6.

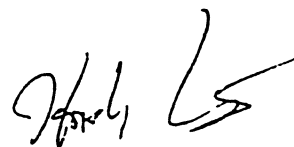
It was a great pleasure to meet you and to talk with you
in Washington.

I received the edited version of my manuscript. I was very
happy to see the beautifully edited version of my article.

I am now herewith sending you back a copy ☒ right form which
you requested to fill out.

Many thanks again for inviting me to write an article in
Physics Today. I hope to see you again in the near future.

Yours sincerely,



Hiroshi Kamimura

S 002215

MOORHEAD STATE UNIVERSITY

A Century of Excellence / 1887-1987

March 10, 1988

Ms. Gloria B. Lubkin, Editor
Physics Today
335 East 45th Street
New York, New York 10017

Dear Ms. Lubkin:

I acknowledge with thanks the receipt of your letter of March 7, 1988, informing me about the acceptance of my manuscript for publication in Physics Today (April issue). I am herewith enclosing the copyright form duly signed.

I take this opportunity to thank you and your associates, especially Jeff Schmidt, for bringing this project to a successful ending. It has been a very rewarding experience for me and I have very much enjoyed working with Jeff Schmidt.

Sincerely,



Vijendra K. Agarwal
Associate Professor
Department of Physics and Astronomy

VJK/lt
enclosure

S 002216

RECEIVED
MAR 1988
1

Giorgio
Margaritondo
Bitnet:
Giorgio@Wiscpsl

mail from JS

Synchrotron Radiation Center
University of Wisconsin-Madison
3731 Schneider Drive
Stoughton, WI 53589-3097 - Phone (608) 873-6651

1988 April 21

Dr. Gloria Lubkin
Editor, Physics Today
335 East 45th Street
New York, NY 10017

RE: My article in Physics Today (April 1988)

Dear Gloria:

Now that my article has been published, I would like to thank you for giving me this opportunity to celebrate the 100th anniversary of Hertz's discovery. As usual, your staff has done an outstanding job in transforming my English-Italian into an impeccable text that Hemingway would not have minded to sign — and my poor pictures into super-sharp figures.

Would you please extend my thanks to the staff that was involved in the production of the article.

With my best regards.

Sincerely,



Giorgio Margaritondo
Associate Director for Research

GM:tlm

S 002217

*To Jeff Schmidt
With appreciation for considerable editorial
help.
Jerome Karle*

MACROMOLECULAR STRUCTURE FROM ANOMALOUS DISPERSION

Jerome Karle

S 002218



MASSACHUSETTS INSTITUTE OF TECHNOLOGY

DEPARTMENT OF PHYSICS

77 MASSACHUSETTS AVENUE
CAMBRIDGE, MASSACHUSETTS 02139

Robert J. Birgeneau

Head of the Department of Physics
Cecil and Ida Green Professor
Of Physics

Room 6-113
(617) 253-4801
Telefax
(617) 253-8554

July 19, 1989

Dr. Gloria B. Lubkin
Editor, Physics Today
335 East 45 St.
New York, NY 10017

Dear Gloria,

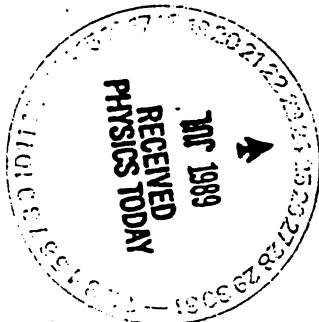
As you realize, our Liquid Crystal article finally appeared in Physics Today and it looks beautiful! I feel obligated to confess to you that you were quite correct in insisting that we simplify the original manuscript. Joel Brock and I have already gotten many compliments on the article - compliments we undoubtedly would not have received for the original version which was too technical. You should also congratulate Jeff Schmidt on a fine editing job. He was a pleasure to work with and he made a number of excellent stylistic improvements.

Best regards!

Yours sincerely,

Robert J. Birgeneau

RJB/km



S 002219

SEP 21 '89 08:53 AMINSTPHYS NYK

P.1/1

21 SEPT, 89

RCA SEP 21 08304
AMINSTPHYS NYK

411059 CERII SU

GLORIA B LUEKIN

EDITOR

PHYSICS TODAY

335 EAST 45TH STREET

NEW YORK N Y 10017

U S A

DEAR GLORIA,

THANK YOU FOR PROVIDING FREE OFFPRINTS. I HAVE ALREADY RECEIVED ABOUT TWENTY RESPONSES ON ENERGY AND MASS. MOST OF THEM ARE FAVORABLE, ONE CRITICAL AND SEVERAL CRAZY. HOW MANY LETTERS HAVE YOU RECEIVED IN CONNECTION WITH MY ARTICLE?

THE OFFPRINT LOOKS QUITE IMPRESSIVE, AND I'M GRATEFUL TO JOFFREY SCHMIDT FOR THIS. I HAVE ALSO RECEIVED A LETTER FROM PETER G. BROWN SAYING "WE ARE PLEASED TO ENCLOSE A COMPLIMENTARY COPY OF OUR JUNE ISSUE". BUT THE COPY ITSELF DID NOT ARRIVE.

I HAVE THE MOST WARM RECOLLECTIONS FROM MY VISIT TO YOUR OFFICE.

WITH CORDIAL WISHES,

LEV OKUN

3

AMINSTPHYS NYK

411059 CERII SU

S 002220

to Jan 15

December 14 '89

Dear Gloria

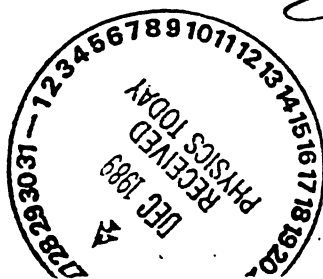
I have just received a
copy of the December issue of Physics
Today. I want you to know how
very pleased I am with the way
my piece has come out. Please tell
that also to all those others who
worked on it.

I am just back from hectic
but very pleasant days in Stockholm
where Ida and I attended the Nobel circus

Warm's greetings

Yours
Bohr

S 002221



CALIFORNIA INSTITUTE OF TECHNOLOGY

Arthur Amos Noyes Laboratory of Chemical Physics, Mail Code 127-72
Pasadena, California 91125

AHMED H. ZEWAIL

LINUS PAULING PROFESSOR
OF CHEMICAL PHYSICS

MAY 1990
RECEIVED
PHYSICS TODAY

Telephone: (818) 356-6536
Telex: 675425 CALTECH PSD.
FAX: 818-792-8456

May 9, 1990

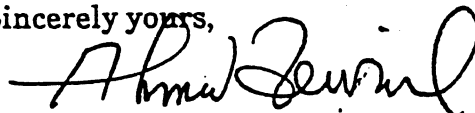
Dr. Gloria Lubkin
Editor
Physics Today
140 E. 45th Street (37th Floor)
New York, New York 10017

Dear Dr. Lubkin:

This letter is regarding the Physics Today special issue on Dynamics of Molecular Systems. As you know, I was one of the authors of the special issue, and I interacted with Jeff Schmidt in the process of producing our article. I wanted you to know that Jeff has made very important suggestions, and I really do appreciate his genuine interest in producing high quality articles. He is excellent and Physics Today is lucky to have him.

I was delighted to write the article, and I hope that this special issue will be of interest to your readers.

Sincerely yours,



Ahmed H. Zewail

AHZ:lm

S 002222



Department of Nuclear Engineering and Engineering Physics

University of Wisconsin

153 Engineering Research Building
1500 Johnson Drive
Madison WI 53706-1687
Phone (608) 263-1646

January 3, 1992

Professor James D. Callen
521 Engineering Research Building
1500 Johnson Drive
Madison, WI 53706-1687
Phone (608) 262-1370
FAX (608) 262-6707
CALLEN@UWM

Gloria B. Lubkin, Editor
Physics Today
335 East 45th Street, 37th floor
New York, NY 10017

Dear Gloria:

As you are undoubtedly aware by now, we have finally completed the two articles on "Progress Toward a Tokamak Fusion Reactor" and "Stability and Transport Processes in Tokamak Plasmas," which will be published in your January issue. I apologize for its taking so long for us to complete them – it took me being on sabbatical this year to have enough time to finally get them completed, even with Rob Goldston ultimately assuming the lead role on the first article. I appreciate your forbearance with our delayed schedule. We are especially pleased that both articles are being published in a single issue with a picture of TFTR on the cover since we now realize how unlikely that situation is under normal circumstances. Finally, I would like to note how helpful your technical editors, Jeff Schmidt and Graham Collins, have been in polishing up these articles and making them much more understandable to the physics community beyond plasma physics. In particular, I learned a lot about simplicity and precision in technical writing from Jeff Schmidt's careful, patient technical editing of my manuscript and my numerous clarifying discussions with him. This experience should be quite helpful to me in my present project – writing a graduate level textbook on plasma physics.

With regard to the free copies of the January issue and offprints which, according to your letter of 22 November, you will be providing for each article, could you please send all of them (total of 6 magazine copies plus 100 + 100 offprints) to me at my University of Wisconsin address. I will take care of distributing them equitably to the six coauthors of the two articles in this cooperative venture. For your reference, we are also ordering through the AIP 600 copies of a special offprint package comprised of the cover and the two articles.

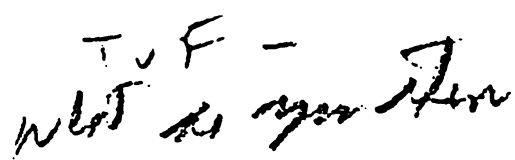
As this saga draws to a close, I wish you the best of luck in dealing with authors and acquiring manuscripts from them in a timely manner – to get them into a magazine that has to be balanced and timely, but in any case must go out monthly. It must be a nerve-wracking job. Best wishes for continued success at it.

Sincerely,

James D. Callen
Kerst Professor of Nuclear Engineering
& Engineering Physics and Physics

JDC:blg
cc: J. Schmidt

S 002223



A. W. Wright Nuclear Structure Laboratory

RECEIVED
SEP 6 1965
PHYSICS TODAY.

August 24, 1983

Dear Hal:

As you know, I maintain concern that nuclear physics gets adequate coverage in Physics Today. I write at this time to bring to your attention the possibility that two of my former colleagues, Robert J. Ascutto and Ernest J. Seglie, might be invited to prepare a paper on Grazing Collisions of Atomic Nuclei for publication in your journal. I have talked with them about this, and at my request, they have prepared a very general sort of talking outline which I enclose. It actually seems to me that this particular outline is much more appropriate for Scientific American than for Physics Today, but Bob and Ernie are the two guys who, perhaps more than anyone else, contributed to our understanding of these collisions and what they can tell us about the underlying dynamics and structure of nuclei. They can write a very elegant article for you. Since it turns out that both of them have won very significant awards for excellence in teaching and clarity in writing, and I think that you and your people would enjoy working with them.

Although both are excellent nuclear physicists, Bob Ascutto is presently completing his residency in pediatrics at the University of Connecticut Medical Center, and Ernie Seglie is a senior staff officer at the Institute for Defense Analysis in Washington. Together, they were members of the Physics Department here at Yale for a number of years. In Bob Ascutto's case, I made the mistake, as Chairman of the Department, of assigning him to teach medical physics to undergraduates. He became so intrigued by this that he decided to undertake a medical program at our medical school in parallel with his duties as an Associate Professor of Physics. Not only did he score at the top of his entire class but also during his last year of the program, he generated five Physical Review ~~Letters~~ which is no mean feat for someone working full-time at physics. In short, he is a very unusual individual.

S 002224

He and Seglie have worked together for many years and have just completed a major chapter for me as part of a treatise on heavy ion science that Plenum Press is publishing. It will be the definitive work on these grazing collisions for a great many years to come, and it is on that basis that I feel quite confident in recommending them to you for a Physics Today article.

I am contacting you at their request and have told them that I have forwarded the outline to you. If you have some interest in this, just drop me a note or give me a call at 203-436-3026 and I will put you in touch with the two of them directly.

In the meantime I must tell you that Jeff Schmidt did an absolutely outstanding job in editing the paper I had prepared on Neutrons in Science and Technology for presentation at the 40th Anniversary of Fermi's First Reactor at the University of Chicago. I made no changes whatsoever in what he had done. You really do not know how unusual that is because, almost inevitably, I end up having giant hassles with editors who work over my papers. Let me then put in a very strong plug for Jeff.

With warmest personal regards.

Sincerely yours,

Allan
(ms)

D. Allan Bromley

DAB:lal

S 002225

Praise for my work from...

Future presidential science advisor

Nobel prize laureates

Prominent physicists

Editor of Physics Today (my supervisor)

Executive Director and CEO of American Institute of Physics